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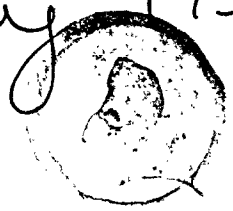
May 1957



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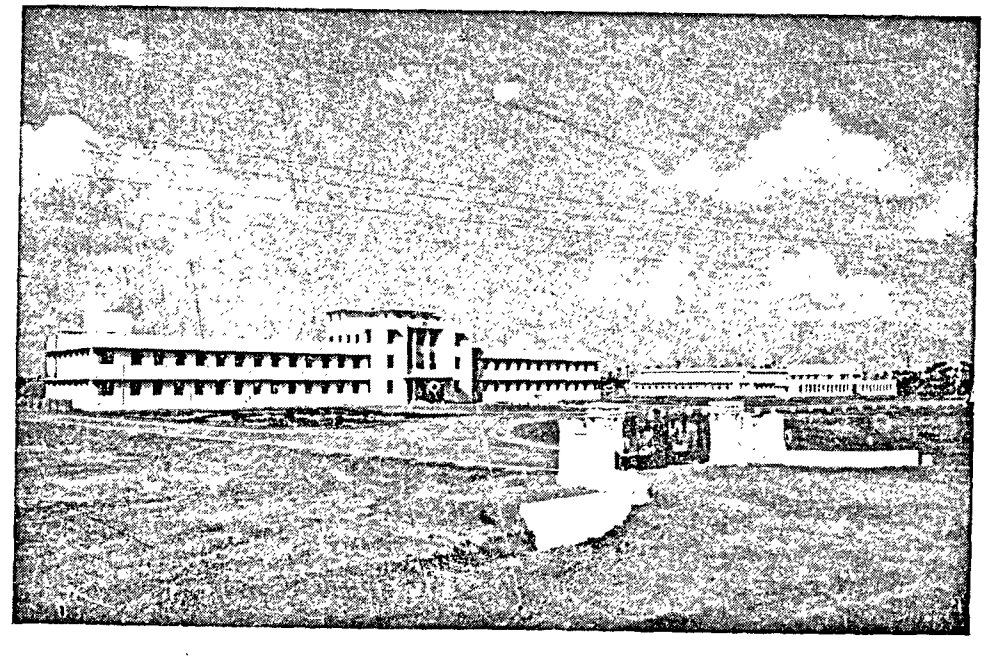

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CONTENTS 319

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NON-AQUEOUS TITRATION TECHNIQUE—PART IV DETERMINATION OF ORGANIC ACIDS AND THEIR SALTS IN BASIC CHROME LIQUORS*

Y. NAYUDAMMA, K. S. JAYARAMAN & D. RAMASWAMY

SUMMARY

The application of non-aqueous titration technique to the determination of weak acids and their salts present in basic chrome liquors was attempted. The principle involved in this method is to precipitate chrome from chrome liquors containing organic acids and their salts by the addition of NaOH. The precipitate is filtered off and the filtrate containing sodium salts is evaporated and the evaporated mass is dissolved in the non-aqueous medium of gylcol-butanol-benzene mixture and titrated with a standard acid potentiometrically. This method gives good results for the determination of total organic acids and salts present in the liquor but the methods fails where acids and salts that form stable chelate complexes with chrome are present.

Chrome liquors prepared by reduction with glucose, molasses etc., contain organic acids and their salts part of which remain in the complexed condition which contributes to their special tanning characteristics. Accurate knowledge of these acid radicals present in the chrome complex as well as in the free state will be very helpful. Adequate analytical methods are, however, lacking for their determinations. Since the non-aqueous titration technique has been applied with success for the determination of weak acids and their salts, an attempt has been made to apply this technique to the study of acid radicals in chrome liquors.

EXPERIMENTAL

Solutions containing different moles of added organic acids and salts to the same 33 1/3 % basic SO_2 reduced Chrome liquor in mole ratios of 1:0.25 ; 1:0.5 ; 1:1 and 1:2 moles were made from standard solutions of organic acids or their salts and allowed to age. Chromium was precipitated as $Cr(OH)_3$ by the addition of sodium hydroxide to phenolphthalein end point. The liquid was boiled to make the precipitation complete and filtered. An aliquot was evaporated and titrated with standard $HClO_4$ acid in glycol-butanol-benzene mixture. The weak acids got converted into their salts by the addition of NaOH which behaved as strong base in non-aqueous medium and the titration curve showed well-defined end points for most of the acids and salts.

*Paper read at Indian Science Congress, 1957 held at Calcutta.

DATA AND DISCUSSION

The curves obtained for acetate, lactate and oxalate when added to basic Chrome liquors at different mole ratios are given in figures 1 to 3. The corresponding blanks for the salts alone

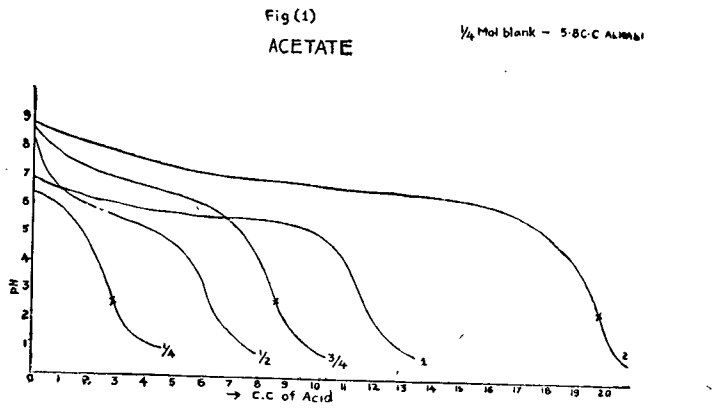

Fig. 1.—Non-aqueous titration of acetate masked chrome liquors. Titre values for addition of ¼, ½, ¾, 1 and 2 moles of sodium acetate per mole of chrome liquor represent ½ the values for corresponding blank.

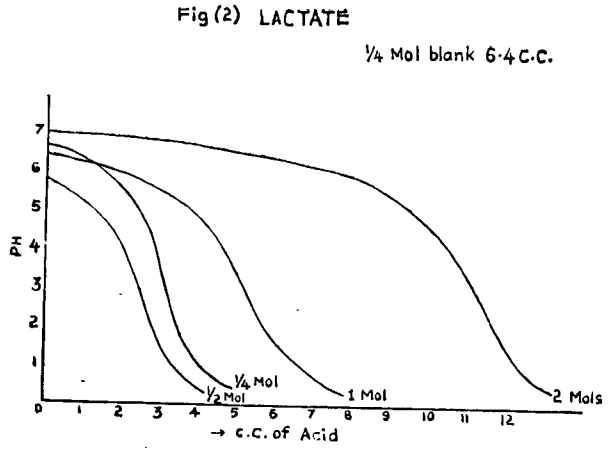

Fig. 2.—Non-aqueous titration of lactate masked chrome liquors. The titre values for addition of ½ mole, 1 mole and 2 moles of sodium lactate represent 1/5th values and addition of ¼ mole represent ½ the titre values for corresponding blank.

are given for the 1:0.25 mole ratios only. It has been found that the oxalate blank showed that only the second carboxyl group is titrated with a clear end point in this medium.

It is seen from the data in case of acetate, the added salt was completely titrated at all the mole ratios. Only the value at 2 mole addition deviated to an error of 6%, probably due to the occulusion of salt by the precipitate of chromium hydroxide.

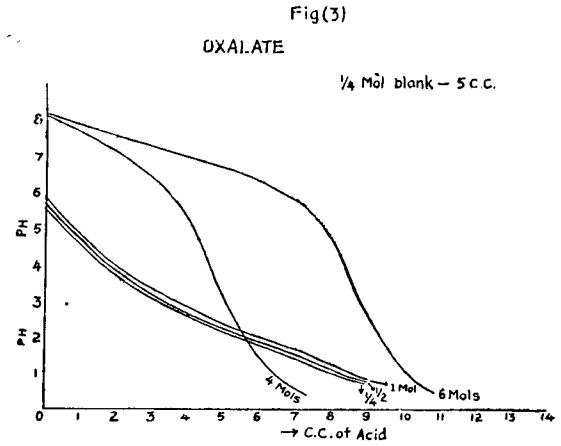

Fig. 3.—Non-aqueous titration of oxalate masked liquors. The titre values for addition of 4 moles and 6 moles of sodium oxalate represent 1/10th values for corresponding blank.

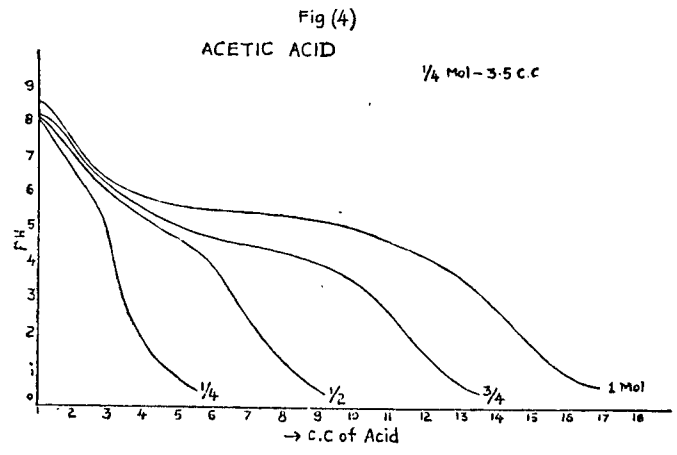

Fig. 4.—Non-aqueous titration of acetic acid masked chrome liquors. The titre values for addition of ¼, ½, ¾, and 1 mole of acetic acid represent the actual values for the corresponding blank.

With lactate, the amount estimated is almost completely titrated at all mole ratios whereas with oxalate upto 1 mole no end point could be obtained (Figs. 2 & 3). However, in the latter

case, if a large amount (say 4 to 6 moles) of oxalate were added to 1 mole of chrome, the curve obtained had the usual shape with a clear end point. From this data, it is clear that the NaOH added has not completely displaced all the titratable organic anion. The difference in values in such cases is probably attributable to the difficulty in penetration of the alkali inside the stable chelated ring structure of chrome formed with organic anion and to the

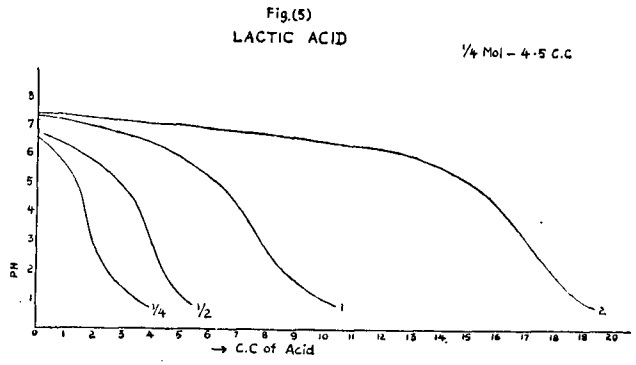

Fig. 5.—Non-aqueous titration of lactic acid masked chrome liquors. The titre values for addition of $\frac{1}{4}$, $\frac{1}{2}$, 1 and 2 moles of lactic acid represent $\frac{1}{2}$ the values for corresponding blank.

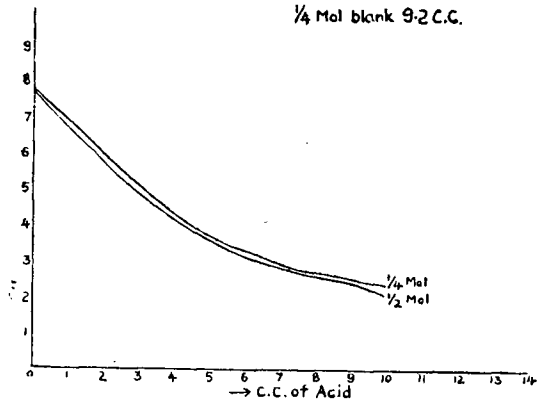

Fig. 6.—Non-aqueous titration of tartaric acid masked liquors.

formation of anionic structures which are not precipitated by alkali. Whereas in case of acetate and lactate the total salt is accurately titratable, indicating thereby that either the chelate structure is not formed at all or the complex is very unstable.

The addition of acids like acetic, lactic, glycollic, oxalic and tartaric acids are represented in Figs. 4 to 8. The blanks for the added acids were determined by normal titration procedure. Excepting tartaric acid, the rest gave well-defined end points.

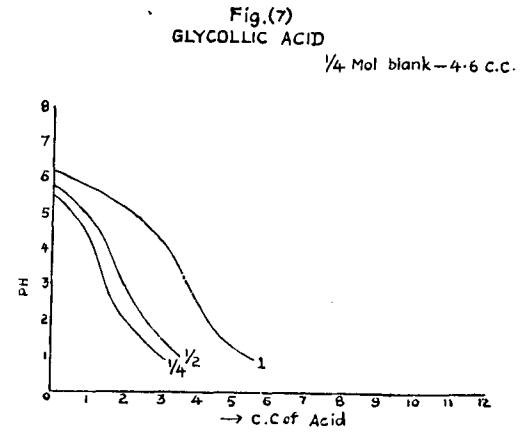

Fig. 7.—Non-aqueous titration of glycolic acid masked chrome liquors. The titre values for addition of $\frac{1}{4}$, $\frac{1}{8}$ and 1 mole of glycolic acid represent $\frac{1}{2}$ the value for corresponding blank.

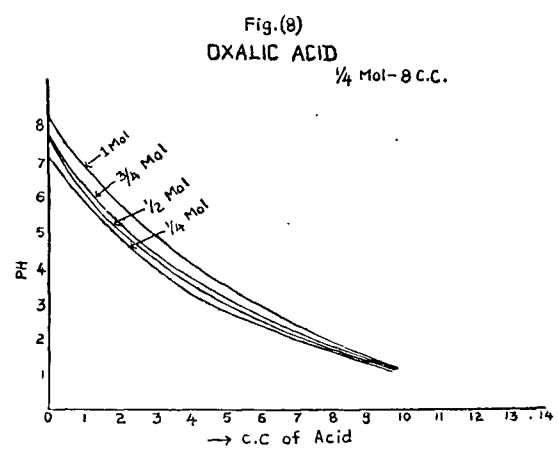

Fig. 8.—Non-aqueous titration of oxalic acid masked chrome liquors.

The curves obtained with acetic and lactic acids (Figs. 4 & 5) showed that the entire acid added could be titrated whereas with glycollic and oxalic acids either part of the acid or no acid was titratable upto 1 mole after conversion into the salt form (Figs. 7 & 8).

This observation confirms the previous finding that the total acid radical is not titrated in case of organic acids which form stable chelated complexes with chromium.

With the present data, it is not possible to speculate whether the titrated salt exists in the free or the combined state. Further work is in progress with the addition of mixture of acid and salt which may throw further light.

Chemistry & Physics Division,
Central Leather Research Institute,
Madras.
April 1957.

RESEARCH BEARS FRUIT

Practical Demonstration No. 4

MANUFACTURE OF SUEDES AND LINING LEATHERS FROM E. I. GOATS*

P. S. VENKATACHALAM

Introduction :

These processes though not entirely new and are, in fact, practised by a few of our progressive tanners, have been studied and developed with a view to popularise them amongst those who are new to this field, particularly the E.I. tanners. The latter are often faced with the problem of disposing their rejection and surplus stocks and even their export-quality leathers when there is a slump in the market. In the circumstances, the tanner is faced to undersell his leathers to others who are able to dress them into finished products that find a market in our country. If, on the other hand, the E.I. tanner can himself do this finishing work, he can make reasonable profits as a result. With little by way of added equipment, he can successfully introduce these processes in his tannery. It is therefore with this object processes are described here for the manufacture of black and fawn suedes for which there is a steady and increasing demand in our country and lining leathers from E.I. goatskins.

MANUFACTURE OF SUEDE LEATHERS

Raw material : E.I. goats and sheep of the medium heavy type are suitable for suedes. Goatskins are to be preferred as they yield products of a higher and tougher texture. Sheepskins have a velvetty nap and make ideal leather for clothing. In the present experiments, goatskins of weight averaging between 10-12 oz. per piece were used. In selecting the material, care should be taken to see that the flesh surface is clean and free from vein-marks, butcher-cuts and pock-marks.

Pre-conditioning and soaking : The skins are weighed, drawn through water and piled for an hour or two by which time

* Process demonstrated to tanners during 14th May—30th May, 1957.

they get sufficiently dampened for shaving. This shaving or 'necking' as it is more appropriately termed, is carried out so as to level down the area around the neck which is usually thicker than the rest of the skin. This operation is done on the grain surface of the material for obvious reasons. Shaving on the reverse side is rarely found necessary and is best avoided. After necking, the skins are soaked in 800%* water and 1% Teepol (Burmah Shell & Co.) in a drum which is run for 15 minutes. The goods are left overnight in this bath. Soaking can also be done in plain water if Teepol is not available. The drum is run for another 15 minutes next morning and drained. The skins are now ready for bleaching.

Bleaching: A bath is prepared as follows:—

Lissatan A.C. (I.C.I.)	2%
Acid oxalic	1%
Calgon (I.C.I.)	1%
Water	400%

The skins are entered into the bleaching liquor and drummed for ½ hour, after which they are washed twice in the drum in 800% water, allowing 15 minutes for each wash. The goods are now horsed to drain.

Chrome tanning: 10% of chrome extract (B & C Mills, Madras) are dissolved in 100% of hot water the previous evening. The skins are entered into the drum with 300% water and ½ the chrome is first added followed by the other half after 30 minutes running of the drum. The goods are kept drummed for 3 hours at which stage the basifying liquor is added to the drum in small doses. Basification is done with 2% sodium sulphite and 1% Borax dissolved in a suitable volume of water. After 4 hours of drumming in all, the skins are horsed. pH of the exhaust bath should be 3.30-3.50 at this stage as tested by test paper (B.D.H. narrow range test paper, 2.80-4.20). Next morning, a sample is cut from the neck of a skin and its shrinkage temperature determined. It should be 100°C or above.

Neutralisation: The skins are washed in the drum with 800% water after 15 minutes and then put in a fresh bath of water, 400% by volume to which 4% hypo has been added and the drum is run for ½ hour. This is followed by another wash in 800% water in the drum for 15 minutes. The goods are then removed and the drum is drained.

* All formulations given here upto the stage of dyeing are worked out on the dry weight of the skins.

Fatliquoring: 3% maida flour is cooked in a suitable volume of water and mixed with 3% china clay and 8% T.R.O. The skins are entered in the drum with 400% water at 45°C and the fatliquor is fed in through the hollow axle in two portions, the second portion being added 15 minutes after the addition of the first half. The drum is run for 1 hour in all. The fatliquored skins are removed, piled for an hour or two to drain and hooked up to dry.

Staking and buffing: The dried skins are damped back by keeping them in moist sawdust for 1 to 2 hours, staked on the reverse side, hung up to dry and buffed with 220 paper first followed with 320 paper. They are dusted off and weighed.

Dyeing: *A* (Blacks).

1st Dyeing: The skins are wetted back in 800%** water for 15 minutes in the drum. The drum is drained and the skins are set afloat in 400% water at 50°C. 2% Naphthalene leather Black 12 B.S. and 3% Nigrosine G 140 are dissolved in a suitable quantity of boiling water, strained through cloth and added through the hollow axle in two portions, the second half being added 15 minutes after the first addition. After 45 minutes run, 2½% formic acid diluted at least with ten times its weight of water is added in a steady stream through the axle. After running for 15 more minutes, the goods are removed, piled to drain and hooked up to dry.

Top buffing and dyeing: The skins are buffed with 500 paper and redyed. If they are somewhat firm, a light staking may be necessary before buffing.

The stock is first wetted back in 400% cold water in the drum for 5 minutes. They are removed and the drum is drained. 4% Basic Black (CLRI mixture) is pasted with 2% Acetic acid and a sufficient quantity of water and added to the dye drum into which the goods have been entered with 400% water at 50°C. The addition is effected in small doses at short intervals. It is found that the dye-bath is exhausted in ½ hour at the end of which period ¼% T.R.O. emulsified in a suitable volume of water is added. The drum is run for another 10 minutes and drained. The skins are piled to drain and toggled till dry.

** These and subsequent formulations are based on the buffed weight.

Finishing: The flesh sides of the skins are sprayed liberally with the following solution :

Glycerin	50 parts
Basic Black	5 parts
Acetic acid	5 parts
Spirit	100 parts
Water	840 parts

The sprayed leathers are dry-drummed for 2-3 hours, removed, hung up till nearly dry and redrummed till the nap is well-opened. (6 to 10 hours).

The suedes are removed, trimmed and measured, cleaned with a soft brush and sorted out.

B. *FAWNS* :

The skins are first wetted back as per blacks. ¼% Naphthalene Orange G.S. dissolved in a sufficient quantity of boiling water is added to a bath of 400% water at 50°C in which the skins have been floated. The goods are run for ½ hour after which period ¼% Ferric Acid diluted with ten times its weight of water is added, through the axle in a slow stream. After running for 15 more minutes, the skins are piled to drain and toggled to dry.

Top buffing and finishing : The skins are buffed with 500 paper and sprayed on the flesh side with the following solution :

Glycerin	50 parts
Spirit	100 parts
Water	850 parts

They are dry-drummed as per Black Suedes, removed, trimmed, measured, brushed and sorted out.

MANUFACTURE OF LINING LEATHERS

Raw material : Any type of E.I. goat or sheep skin can be used for producing lining leathers, provided it is neither too thick nor papery and free from excessive grain damage.

Preliminary work : The skins are weighed, drawn through water, piled for 1-2 hours and shaved. Shaving is done on the flesh side, generally around the neck part of the skin so as to make it level throughout. Levelling is of more importance here as the leather is to be glazed subsequently. The shaved leather is run in the drum for 15 minutes with 800%* water. Next morning, the drum is run for another 15 minutes and drained.

Bleaching and chrome tanning and Neutralisation :—As under Suedes.

Fatliquoring : Fatliquoring is carried out in the drum using the following materials.

400% water at 50°C.
4% T.R.O.
½% Fixanol V.R.

The goods are entered into the drum with hot water and the fatliquor is added through the hollow axle in a slow stream after dilution with four times its quantity of water. After 30 minutes run, the fixanol diluted with 4 times its volume of water is added in a continuous stream. The drum is run for another ¼ hour after which period the skins are removed, horsed to drain and toggled to dry.

Staking and buffing : The dry skins are saw-dusted for 2 hours staked and buffed with 200 papers, on the flesh side. Grain damaged skins are snuffed on the grain side with 320 paper.

Finishing :

Stain : Grey 1.0 gm. Nigrosine G 140 (I.C.I.).
1 pint water.

* All formulations on the dry weight of skins.

Champagne 1.0 gm. Naph. Scarlet J.S. (I.C.I.).
1 pint water.

Mucelage coat : Linseed mucelage 2½% solution.

Season : 1.0 lb. pigment paste (Lechinol).
12 oz. Casein solution (10%).
4 oz. Shellac solution (10%).
2 oz. Gelatin solution (10%).
2 oz. T.R.O.
Water to make 1 gallon.

Top : 1 lb. Casein solution (10%).
1 lb. formaldehyde (40%).
Water to make 1 gallon.

The stain is prepared by dissolving the requisite quantity of dye in a suitable volume of boiling water and diluting it further to the required concentration.

The linseed mucilage is prepared by soaking overnight 5 oz. of linseed in 3 pints of water and boiling it for an hour next morning. It is strained through cloth and diluted to 1 gallon.

Dispersion of Casein is effected by soaking overnight 1 lb. of casein in 4 pints of water to which 4 ozs. of borax dissolved in 4 pints of hot water are added next day. The mixture is then stirred and boiled till it attains a thin consistency. After cooling, it is made upto 1 gallon. 1 oz. of 'Dettol' may be added to the casein dispersion as a preservative if it is desired to keep it for a few days. It is always good practice to prepare the casein solution and use it all up the same day. A satisfactory binding of pigment to the leather is achieved thereby.

4 ozs. of borax are dissolved in 6 pints of boiling water to which 1 lb. of shellac flakes are added in small quantities with stirring, till the schellac is completely dissolved. The shellac dispersion is strained through cloth and diluted to 1 gallon. ½ oz. of dettol may be added as a preservative.

1 lb. of gelatin is soaked overnight in a gallon of water. Slight warming the next morning will bring about the complete

dispersion of the gelatin. 1 oz. of dettol may be added as a preservative against putrefaction of the gelatin.

In finishing the skins, a liberal coat of the stain is applied both on the grain and flesh sides followed by a coat of the mucilage on the grain. After drying it well, two pad coats of the season followed by a spray coat are applied. The Top is prepared by adding 1 lb. of Formaldehyde (40% soln.) to 1 lb. of casein soln. (10%) diluted with 8 lbs. of water with stirring. This is sprayed on the leather which is well dried and glazed.

The pieces are trimmed, measured and sorted, if necessary.

TECHNICAL SEMINAR *

FAT LIQUORS

V. R. KISHORE

Fatliquors are a class of important leather auxiliaries which are usually based on oil, fat and related materials. Fatliquoring is the treatment of leathers in an emulsion of the oil in water in order to impart the desired physical properties like softness, suppleness, strength etc., to upper and other leathers. The emulsifiers are usually classified as anionic, cationic and nonionic, depending upon the change of the ion responsible for the surface activity. Among these, anionics are widely used in leather field, the important ones of these being soaps and sulphated oils. Soaps exhibit certain undesirable properties in that they are unstable to hard water and acids and hence were superseded to some extent by sulphated oils. Since a large number of different types of sulphated oils could be made from these fatty oils and the process also is rather easy, there is a great demand for these products.

The process of sulphation essentially consists of the addition of required amount of the sulphating agent usually concentrated sulphuric acid at a definite temperature, adding necessary amount of a salt solution or water to remove the excess acid, and neutralising the product with a suitable alkali to the desired pH. But the fixing up of these optimum conditions requires the performing of a number of experiments. Later on the methods are to be standardised. In the Institute till now oils like pongam, pinnay, fish, tobacco seed, rice bran and cotton seed oils have been successfully sulphated and suitable fatliquors made by adding required quantity of neutral and mineral oil wherever necessary. Since Pongam oil gave very good results comparable to the Cremols, bigger lots of 100 lbs. at a time were made in a pilot plant and the fatliquor supplied against orders from various commercial tanneries. Further work is in progress to make fatliquors from other oils also in pilot plant scale. Certain aspects of the mechanism of sulphation, the effect of sulphated products on the physical and chemical characteristics of leathers were discussed.

* Summary of the Technical Seminar held on 26th April, 1957.

CLASSIFIED ABSTRACTS

RAW MATERIALS

RECENT ADVANCES IN THE USE OF INSECTICIDES IN ANIMAL HEALTH. *J. Carmichael, Chem. & Ind. No.* 40, 1078, (1956). The various insects such as tsetse flies, ticks, mange parasites, biting flies, sheep blow-flies, keds, lice and warbles etc. that cause deterioration of the animal health and damage to hides and skins and various existing remedies to eradicate them are reviewed with the economic view point of the development of livestock industry. Necessity for further biological and chemical research in order to overcome the menace of resistant strains, simpler methods of application and better methods of control were emphasized.

K.S.R.

VEGETABLE TANNING

WATER ABSORPTION OF VEGETABLE-TANNED LEATHER. *Humberto Giovambattista and Alberto A. Giacomi. J.A.L.C.A.* **51**, 6, 283, (1956). Measurements of water absorption, volume, and porosity were made on 180 pieces of cowhide, distributed over the butt and back area, before tanning and at several stages of tannage. The effects of location in the hide, degree of tannage, water-soluble matter content, and compression by rolling, on total water absorption, bound water, and capillary water, are discussed.

DESTRUCTION OF TANNIN DURING CHEMICAL DEBARKING OF OAK TREES. *C. W. Beebe, J. S. Rogers, M. L. Happich and F. C. Simmons. J.A.L.C.A.* **51**, 6, 266, (1956). Debarking oak trees by girdling and treating with sodium arsenite causes a loss of about 50% of the tannin in the bark after weathering for one year. Girdling alone followed by subsequent weathering results in a change in tannin content which may vary from a 8% gain to a 50% loss. The loosening of bark from dead trees and subsequent weathering may be the prime cause of tannin loss rather than the nature of the chemical used. If this is the case, modification of the process by using other materials is not promising, because any material which would loosen the bark so that it could be removed easily would destroy tannin.

OTHER TANNAGES

ZIRCONIUM RETANS GIVE GOOD ABRASION RESISTANCE. *Lea. Tr. Rev.*, **123**, 3692, 103, (1957). Zirconium retan sole leather is claimed to show outstanding abrasion resistance and water-proofing properties in tests organised at BLMRA. Zirconium tanned upper leather has got two great advantages over chrome tanned upper leather. It gives a very white leather. It has also an important bearing on dyeing,

particularly when light shades which are effected by blue tinge of chrome in the chrome leathers, are required. The other advantage is that it gives fuller leather due to the penetration of more tanning agent into the pelt. The availability of zirconium salts at permissible rates will make the salts useful for sole leather tannage. Further investigations should be done on straight zirconium tannage and Cr-Zr tannage for fuller upper leathers. Zirconium is more abundant than nickel, copper, lead and zinc and commercially useful quantities are found in the beaches of U.S. It is hightly abundant also in Australia, India and Brazil along the beaches.

K.S.R.

THE EFFECT OF THE PREVIOUS HISTORY OF SULFITE CELLULOSE LIQUORS ON THEIR TANNING PROPERTIES AND ON THE PROPERTIES OF SYNTHETIC REPLACEMENT TANNINS MADE FROM THEM. *F. Stather, H. Herfeld and R. Reich. Ges. Abhandl. Deut. Lederinsts. Freiberg/Sa.,* 10, 5-15, (1954). *Via. J.A.L.C.A.* **51**, 6, 326, (1956). Liquors from 8 different sources were tested. Of these, 3 represented "hard", 2 "medium", and 3 "soft cooks". One liquor of each type was fermented to lower the sugar content ; the others were not. All were purified by treatment with Na_2CO_3 and concentrated to about 60% solids. The purification raised the ash content but apparently lowered the analytically determined organic non-tannin content, so that the purity (about 50) was unchanged. Apparently some organic non-tannin was changed into material absorbed by hide powder during the alkaline treatment and evaporation. The purified lignosulfonates varied in methoxyl content from 4.0 to 7.2% (dry basis). The 8 materials differed very little in ratio of tannin to soluble solids, tan value (46-48), combining value (29-30), or fraction precipitated by saturated NaCl (33-42%). None of them was a good tanning agent. Three series of syntans were prepared by condensing each of the 8 lignosulfonates with (*a*) phenol + 2-naphthol, (*b*) phenol only, and (*c*) dihydroxydiphenyl sulfone. Tests of the products, including small scale tanning tests, showed no differences within any one series attributable to differences in the original sulfite cellulose liquor. All were satisfactory tanning agents. The authors conclude that the method of cooking (hard, medium, or soft), and the removal of sugars by fermentation, have no effect on the tanning characteristics of lignosulfonates, alone or condensed with phenolic compounds.

THE RELATIONSHIP BETWEEN THE PHENOLIC CONTENT OF LIGNIN SULFONATES AND THEIR TANNING PROPERTIES. *H. B. Marshall and A. G. Newcombe. Pulp & Paper Mag. Canada,* **56**, 101-5, (1955). *Via. J.A.L.C.A.* **51**, 6, 327, (1956). In addition to work on condensation of lignisulfonic acid with phenols, which was published in J.A.L.C.A. **50**, 85, (1955), the authors describe experiments in which lignisulfonic acid was demethaxylated by chlorination. Commercial, fermented, waste sulfite liquor was dialyzed, passed through a cationic exchanger to remove Ca, then through an anionic exchanger to remove low molecular weight acids, chlorinated in the dark at room temperature, and freed from HCl by ion exchange. The ratio of Cl to dry lignisulfonic acid was 191:227. Half the Cl appeared to be bound to aromatic, and

half to aliphatic, carbon atoms. Hydroxyl groups appeared to be formed by hydrolysis of ether linkages. Demethoxylation appeared to take place by successive formation of methyl alcohol and formic acid rather than methyl chloride. Some sulfonic groups were removed. Half the Cl was split off by treatment with NaOH. Tanning tests gave the following results :

Tannage	Weight yield	Shrink Temp , °C	Colour	Softness of grain	Smoothness of grain
Dialyzed ligninsulfonic acid	123	68.5	Medium brown	Hard	Fairly smooth
Same, chlorinated	135	75.5	Medium brown	Rather hard	Smooth
Same, chlorinated and hydrolyzed	140	76	Dark brown	Fairly soft	Smooth
Quebracho	170	84.5	Light reddish brown	Very soft	Very smooth

While the chlorination definitely improved the tanning properties, this betterment was not considered sufficient to justify the high cost of such a process.

THEORIES

SYSTEMATICS OF THE INFRARED SPECTRAL PROPERTIES OF HYDROGEN BONDING SYSTEMS : FREQUENCY SHIFT, HALF WIDTH AND INTENSITY. *Charles M. Huggins and George C. Pimentel. J. Phys, Chem.* **60**, 12, 1615, (1956). Three spectral properties, frequency shift $\triangle V$, band width $V_{\frac{1}{2}}$ and integrated intensity B, have been measured for a variety of hydrogen bonding systems X-H . . . Y in solution. A linear relation is found between $\triangle V$ and $V_{\frac{1}{2}}$ which is applicable to a wide variety of systems : $V_{\frac{1}{2}} = 0.72 \triangle V + 2.5$ cm. $^{-1}$. A simple monotonic relation is also found between $\triangle V$ and B. The intensity is discussed with reference to the intensities of X-H bonding modes ; polarization in the base molecule is suggested.

THE CRYSTALLINE STRUCTURE OF MELANIN, KERATIN AND COLLAGEN. *Emil Meirowsky. J. Invest. Dermatol.,* 26, 95-104, 1956. *Via. Chem. Abst.* 50, 109, 1956 *& Brit. Gel. & Glue Res. Assoc.,* **7**, 4, 12, (1956). Crystals of melanin, keratin and collagen have been demonstrated by polarization and have been formed by the action of ultrasonic waves and by treatment with hydrogen peroxide.

PRECIPITATION IN VITRO OF COLLAGEN A BY A BACTERIAL ENDOTOXIN. PRELIMINARY NOTE. *Albert Delaunay, Suzanne Bazin and Michelle Henon. Ann. Inst. Pasteur,* 90, 258-64, (1956). *Via. Chem. Abs.* 50, 10820d. (1956). *Via. Brit. Gel. & Glue Res. Assoc.* **7,** 4, 11, (1956). Soluble collagen A combined with typhoid endotoxin to form an insoluble precipitate at pH 4.3. At pH 1.5 or 12 the complex was completely soluble. When heated for 3 minutes at 56°, it dissolved ; in the presence of 0.5M calcium chloride it dissolved at 46°. Sodium chloride (0.427M) or sodium cyanide (0.5M) inhibited the precipitation of the complex. Xylose, glucose, fructose, galactose, maltose or sucrose in 10% concentration did not influence the formation of the precipitate. When endotoxin, carrageen, and collagen were mixed, the collagen combined with the saccharide derivatives. Heated collagen gave the same precipitate with endotoxin but in lower yield. The complex of endotoxin and formolinized collagen was more heat stable than was the normal complex.

THE COMBINATION OF COLLAGEN A AND CHONDROITIN-SULPHURIC ACID. *Suzanne Bazin and Albert Delaunay. Compt. Rennd.,* 242, 834-6, 1956. *Via. Chem. Abst.,* 50, 8773b., 1956 *and Brit. Gel. & Glue Res. Assoc.,* **7,** 4, 11, (1956). A heavy fibrous precipitate forms when a ml. of collagen A (1 mg./ml.) is added to a ml. of chondroitin-sulphuric acid (I) containing 0.1-1 mg./ml. at pH 4.3. By using 0.2 mg./ml. of I a precipitate forms at any pH between 2 and 8, with abundant precipitation at pH 3-5. The precipitate was shown to be a combination of collagen A with I since the supernatant liquid held no collagen and the precipitate when hydrolyzed gave a Molisch test. The precipitate dissociates at a pH lower than 1.5 and higher than 11, and in 0.5M calcium chloride. It is stable to heat, but contracts to an elastic mass at high temperature. Addition of sodium chloride can prevent the precipitate from forming. In 0.213M sodium chloride a precipitate forms that is more stable than the sodium chloride-collagen precipitate, but less stable than the collagen-I precipitate.

THE INTERRELATIONSHIP AMONG THE FIBROUS STRUCTURES OF THE CONNECTIVE TISSUE IN THE LIGHT OF NEW DATA CONCERNING THE STRUCTURE OF COLLAGEN. *G. V. Orlovskaya. Arkh. Patol.,* 18, 68-74, 1956. *Via. Chem. Abst.,* 50, 8762b., 1956 *& Brit. Gel. & Glue Res. Assoc.,* **7,** 4, 12, (1956). Collagen presents a polyphase system, the basic components of which are procollagen and a residue known as collastromin which is the base of collagenic fibres. Histochemical studies of the residue indicated that collastromin contains acid sulphated mucopolysaccharides which become accessible to histochemical reactions after the tissues are freed from procollagen. After the complete removal of procollagen during impregnation with silver, there become visible argentophilic fibres in the area of the collagen bundles, which are a part of collastromin ; i.e., they are an element of the base of collagen fibres. In the light of these new concepts argentophilic fibres observed in the fibroid changes of the connective tissue are the argentophilic protein of collastromin, which appeared after the softening and removal of the procollagen.

MOLECULAR CONFIGURATION OF GELATIN. *E. V. Gounilock, Jr., P. J. Flory and H. A. Scheraga. J. Poly. Sci.,* 16, 383-395, (1955). *Via. Brit. Gl. & Glue Res. Assoc.,* **7,** 4, 13, (1956). A quantitative study of polypeptide chain flexibility in solution (molar KSCN, 30°C, pH 6.5) for two high molecular weight alkali process gelatin fractions. It is concluded that the gelatin molecule is very similar to synthetic chain polymers in configurational character in the solvent used.

TESTING

HIDE EVALUATION. THE SAMPLING OF CATTLE HIDES FOR THEIR LEATHER-MAKING SUBSTANCE. *C. Deasy. J.A.L.C.A.* **51,** 6, 271, (1956). Determinations of total nitrogen, hydroxyproline, water, and ash were made at 21 locations on each of ten brine-cured steer-hide sides. A location adjacent to the backbone and 20 to 28 inches forward of the root of the tail is most nearly representative of the average composition of the whole side.

COLOR REACTIONS OF ALDEHYDES AND KETONES WITH VANILLIN IN ALKALINE MEDIUM. *Victor E. Levine and Michael Taterka. Anal. Chim. Acta,* **15,** 3, 237, (1956). Vanillin in alkaline medium is a very useful reagent for the detection of carbonyl-bearing compounds, especially ketones, yielding yellow, orange or red colorations in the reaction mixture. The intensity of the reaction and the particular color produced depends upon the constitution of the compound and its concentration. The reaction works best with aliphatic ketones, especially when these contain a methyl group. Acetone with two methyl radicals yields the maximal color. As the carbon chains in the ketone radicals lengthen, reactivity diminishes. Aromatic ketones are least reactive or do not react at all.

SOME APPLICATIONS OF THE DIFFERENTIAL GALVANOMETER IN POLAROGRAPHY. *E. Barendrecht. Anal. Chim. Acta,* **15,** 5, 484, (1956). A description is given of some advantages of the differential galvanometer in the recording of normal polarograms (damping of oscillations), in differential polarography (simplification of the SEMERONO-RICCOBONI circuit) and particularly in derivative polarography. The height of the maximum of a derivative curve (i_n) is determined as a function of the diffusion current (i_d) (and hence of the concentration), the potential difference between two dropping mercury electrodes ($\triangle E$). the cell resistance (R) and the type of the electrode reaction (k).

Directives for the derivative-polarographic recording technique are outlined and the method is compared with that of VOGEL-RIHA.

DIRECT SPECTROPHOTOMETRIC DETERMINATION OF SMALL AMOUNTS OF CHLORIDE. *Philip W. West and Hans Coll. Analy. Chem.* **28,** 12, 1834, (1956). There has long been a great need for a direct spectrophotometric method for the determination of small amounts of chloride. Such a procedure is now proposed, based on the use of iron (III) perchlorate. Chloro complexes of iron (III) exhibit an intense

absorption band in the vicinity of 340 m and lend themselves to quantitative measurement. The proposed procedure is accurate and relatively free from interferences. Large amounts of sulfate tend to interfere. However, the method can be used in the presence of the other halides and practically all other common ions.

SPECTROPHOTOMETRIC DETERMINATION OF ALKYL BENZENESULFONATE DETERGENTS IN SURFACE WATER AND SEWAGE. *John D. Fairing and Frank R. Short. Analy. Chem.* **28**, 12, 1827 (1956). A method for the determination of alkyl benzenesulfonates in surface water and sewage is based upon the isolation of the alkyl benzenesulfonate from interfering materials, by solvent extractions of its 1-methylheptyl-amine salt, and measurement of the isolated benzene-sulfonate by an improved methylene blue method. The procedure will measure less than 1 p.p.b. in water and 50 p.p.b. or less in sewage. It is not subject to any known interference from materials likely to be present in surface water or sewage.

THE DETERMINATION OF PHENOLS BY CHROMATOGRAPHY AND SPECTROPHOTOMETRY OF THEIR METHYL ETHERS. I. ULTRAVIOLET ABSORPTION ARYL ETHERS IN CYCLOHEXANE. *B. T. Commins and A. J. Lindsey. Anal. Chim. Acta.* **15**, 5, 446, (1956). In this, the first of a series of papers on the determination of phenols by chromatography and spectrophotometry of their methyl ethers, the determination of the ultra-violet absorption spectra in cyclohexane solution of a number of methyl ethers derived from phenols commonly present in combustion products is described.

ELECTROPHORESIS OF POLYPEPTIDYL PROTEINS. *Harold Van Kley and Mark A. Stahmann. J. Phy., Chem.* **60**, 9, 1200, (1956). Changes in the electrophoretic mobility of bovine albumin and rabbit albumin after modification by the chemical attachment of polypeptides of leucine, phenylalanine, lysine and glutamic acid are reported. Some interpretations of the results and possible application of polypeptidyl proteins to physical chemical studies are discussed.

POTENTIOMETRIC DETERMINATION OF THE BASE STRENGTHS OF AMINES IN NON-PROTOLYTIC SOLVENTS. *H. K. Hall, Jr. J. Phy., Chem.*, **60**, 1, 63, (1956). A reproducible titration method was devised and successful potentiometric titrations were performed on a large number of monoamines and diamines in five solvents of varying nature : ethyl acetate, acetonitrile, nitrobenzene, nitromethane and ethylene dichloride. The titrant acids were perchloric, p-toluenesulfonic and perfluorobutyric, all in dioxane solution. Methanesulfonic acid was used as solution in the given solvent. The mid-point of the titration curve was taken as a measure of the dissociation constant of the amine. The existence of quantitative linear relationships between the midpoint readings ($E_{\frac{1}{2}}$) and the Hammett σ— constants in the water for m- and p-substituted anilines was established. For the alkylamines the observed order of base strength was : $NH_3 < RNH_2$, $R_2NH > R_3N$, an order similar to that observed in water or alcohol. As the length of the alkyl chain increased to four or five carbon atoms, the base strength

was lowered. Diamines, such as ethylenediamine, hexamethlylenediamine and the piperazines behaved in acetonitrile as rather strong bases. Polar substituents in the piperidine ring as in morpholine, monoacylpiperazines, etc., decreased the base strength of the parent amine as expected. The order and even the quantitative strength of the bases were independent of solvent or of acid for the five organic solvents. When data for organic solvents were plotted against those for water, acceptable linear plots were obtained (with one exception—see below). Even this extreme change of solvent does not affect relative base strength. The exception noted above referred to amines containing a strongly polar group near the N atom, such as morpholines and monacylpiperazines. These bases are much stronger in organic solvents than their pK_a values in water would predict. A discrepancy between the predicted and observed slopes of the plots of El/2 against pK_a is explained in terms of variations in the activity coefficients of the ammonium ions relative to the corresponding amines.

EVALUATION OF INSOLE LEATHERS. *Charles W. Mann and Edward T. Steiner. J.A.L.C.A.*, **51**, 6, 304, (1956). The results of a series of shoe-wearing trials on various types of insole leather are presented. The tannages and treatments for insole leather include processes such as the application of oil, formaldehyde vapour and aluminum salts as well as combination tannages. Outstanding results were obtained with the combination chrome-vegetable tannage which consistently performed beyond other processes in all the trials. An alum-vegetable tannage proved very satisfactory in one test but it was unsatisfactory in another. The formaldehyde vegetable tannage also proved more resistant to cracking than the vegetable-tanned leather. Variations in the vegetable tannage were less effective in improving the quality of insole leather. The conventional chemical and physical tests of insole leather were not closely related to the results of the field trials. Other laboratory tests showed some promise for screening purposes in the selection of materials for further study but when used alone they did not prove reliable as a means of evaluation.

SATRA PROCESS CONTROL. *SATRA Bulletin*, **7**, 13, 116, (1957). Satra Process Control is a method of examination which draws attention to any process which is tending to deteriorate. It does not of itself do anything to remedy the trouble. That is, and will remain, the responsibility of the production staff in the factory. The system is based on a sample examination of shoes at selected stages of manufacture and the examination is carried out to a quality standard which is considerably higher than that normally adopted in the factory.

The results of the examination can give information about faults in workmanship, design, or management and are particularly valuable in enabling foremen to take action when any fault is becoming serious and in keeping the higher management informed about quality standards. All levels of management can act on the information with confidence and with the minimum expenditure of time and energy, whilst praise can be given with the knowledge that it has been earned.

To the operatives it gives an accurate visual picture of the day-to-day changes in the quality of their production and encourages that interest and pride in workmanship which are so necessary to-day. The type of examination used also reduces to a minimum the possibilities of unfairness and personal bias on the part of the examiners or the foreman and can thus remove a source of irritation and help to improve human relations in the factory.

BYE-PRODUCTS

THE EFFECT OF STEAM ON WOOL FIBRE PROPERTIES. *C. H. Nicholls. Aust. J. Appl. Sci.* **7**, 4, 365, (1956). The effect of steam at pressure upto 12 lb./in^2 and for different periods on wool in a neutral, alkaline and acid conditions, has been studied by measuring breaking-loads, yarn elongation at break, abrasion resistance, reflectance, alkali solubility and disulphite-S-content.

It has been observed that the treatment causes great damage to the fibres containing residual alkali even at the atmospheric pressure, whereas under acidic conditions, the fibres easily stand a ½ hour treatment at 12 lb./in^2 pressure (117°C).

From the marked decrease in the disulphide-S-content of the fibres under alkaline conditions, the damage is ascribed to the breakdown of disulphide bonds.

G.R.C.

SHRINK-RESISTING WOOL : SOME NOVEL FEATURES AND THE DESCRIPTION OF A NEW PROCESS. *Davidson, A. N. and Preston, R. J. Text. Inst.* 47, 685-703, *August* 1956. *Via Am. Dyestuff Rep.* **45**, 27, 985, (1956). Generally the shrinkage of wool fabrics is caused either by the relaxation of finishing strains or by the felting or matting together of the fibers when wool in any form is submitted to a series of alternate compressions and relaxations, especially in the presence of water, acides or alkalis.

The authors briefly refer to the various methods that have been used in the past to produce shrink-resisting wool goods, as follows : Treatment with chlorine and related compounds. Treatment with binary or ternary mixtures of nonaqueous solvents and alkalis. Treatment with enzymes. Other treatments (hydrogen peroxide, sodium chlorite, and resins): They mention the increasing use of other fibers (nylon, Terylene, Orlon, cotton, etc.) in blends with wool, and discuss the possible adverse effect of the shrink-resist finishes on these fibers. Most shrink-resist finishes, when applied under controlled conditions, do not modify wool chemically to any appreciable extent. Over-treatment results in a partial conversion of disulfide sulfur into cysteic acid, and in an increased solubility of the wool in alkaline and acid solutions. In the methods using solutions of chlorine or hypochlorous acid, care must be taken to ensure that the solution is maintained at pH 5 or below, otherwise yellowing of the fibers occurs which cannot be removed even by bleaching. The authors describe in much detail a series of new experiments performed with peracetic acid as a pretreatment of the wool, followed by (1)

treatment with papain, (2) treatment with hypochlorite. It was found that both papain and chlorine under these conditions make wool fabrics satisfactorily resistant to felting. The best results were obtained with peracetic acid at a pH of 3. A subsequent treatment with sodium bisulfite improves the white.

ADHESIVE FROM CHROME LEATHER CUTTINGS AND DUST. *A. D. Tolochko, I. A. Lyulkin and G. S. Lyubomirskii. Legkaya Prom.*, 1955, **15**, 45-6. *Via. Chem. Abs.*, **50**, 7492g., (1956). The material is ground, then subjected to combination detanning and cooking with 6.5-7.5% magnesium oxide. Fractional take-off of broth is done 6 and 10 hours after start of cooking. The product is filtered, centrifuged, and spray dried.

GENERAL

PROPERTIES AND APPLICATIONS OF SEQUESTERING AGENTS. *R. S. Smith, Chem. & Ind.*, **44**, 1284, (1956). The sequestering agent is considered in this paper as soluble chelate with a metal. The nature of chelation, stability of chelate ring, quantitative consideration of competition in chelation equilibria, sequesteration of iron under alkaline conditions are discussed in brief. Practical and industrial applications of the sequestering agents in agriculture, analytical chemistry, cosmetic and pharmaceutical industries, foodstuffs, metal industry, photography, oil refining and rubber, textile and leather industry are discussed. In the leather industry, these agents are used in soaking of imported hides to give good results by starving bacteria and in tanning liquors to prevent discolouration of the leather by iron.

K.S.R.

PATENTS

EXTRACTING ANIMAL GLUE. *Harvard L. Keil, August L. Lolli, Edward F. Cavanaugh. U. S. Pat.* 2,751,377, (1956). *Via Chem. Abs.*, **50**, 13490g., (1956). *See also B.P.* 750,825, (1956). *Via. Bri. Gel. & Glue Res. Assoc.* **7**, 4, 6, (1956). Animal glue was extracted from salt-cured cattle hide trimmings and scraps and fresh cow shanks by first soaking in hydrochloric acid at pH 2 for 4 days. Then the materials were washed and calcium carbonate was added. The glue was extracted on a schedule of four 3-hour cooks at 65°, 75°, 85°, and boiling with 45, 30, 15 g. of calcium carbonate per 10 lb. batch in the first 3 cooks, respectively. This process gave a glue with high gel strength and viscosity.

BLEACHING OILS AND FATS AND PREPARATION OF A LIQUID BLEACHING AGENT. *Kali-Chemie A.-G.* (*B.P.* 742,233, 24-12-53. *Ger.*, 2-2-53). *Via. J. Appl. Chem.* **6**, 12, 464, (1956). Oils and fats are bleached by treatment with a stable highly viscous solution of a neutral alkali metal salt of $H_4P_2O_7$ in H_2O_2 in the ratio of 1 mol. of pyrophosphate to 3-7 mol. of H_2O_2. The bleaching agent is made by dissolving $Na_4P_2O_7$ in 35% by wt. of aq. H_2O_2 solution in the ratio of 1 mol. of $Na_4P_2O_7$ to 3-7 mol. of H_2O_2 and concentrating the solution, preferably *in vacuo*.

BLEACHING OF WOOL. *Institute Textile de France and Centre de Recherches textiles* (*Inventors* : *J. Meybeck and C. Schirle*) (*B.P.* 743,927, 22-5-53). *Via. J. Appl. Chem.* **6**, 12, 470, (1956). Wool is simultaneously bleached and rendered shrink-resisting by treating it in the cold (20°) with an acid aq. solution (pH 2—4.5) of an alkali metal chlorite until the wool turns pink, and thereafter bleaching with a reducing solution (of an alkali metal bisulphite and/or hydrosulphite). The chlorite solution may contain an activator such as quinol for activating the solution by promoting the formation of chlorous acid.

ACCELERATOR FOR USE IN DYEING ANIMAL FIBRES. *Cetesel. B.P.* 757,491. *Via. J. Soc. Dyers & Col.* **72**, 12, 592, (1956). The material obtained by boiling animal fibres, *e.g.* waste wool, with an aqueous alkylsulphonic acid or dialkylsulphite, is treated with an alkyl borate. The resulting product when added to a dyebath containing acid, pre-metallised or mordant dyes reduces both the time and the temperature needed for dyeing and chroming.

NOTES & NEWS

TITANIUM PIGMENT. *Lea. Tr. Rev.* **122**, 3683, 284, (1956). Anatase L.F., the new titanium oxide pigment of British Titan Products Ltd., York, is claimed to have superior dispersion properties. It is a fine particle modified pigment with the Anatase crystal structure and has been added to the firm's range to meet the call for a pigment of superior whiteness with good dispersion characteristics. It is not self-dispersing in water but can readily be dispersed by the addition of small amounts of suitable agents, *e.g.* sod. hexametaphosphate. Technical information and samples can be obtained on request.

COMMERCIAL INFORMATION

The following German trading organisations are interested in the import of Semi-tanned East India Goat and Sheep skins from India. Interested parties may please contact them.

1. Lederkern, Kern & Dechert, Inh. Carl Kern, Ledergrosshandel, *Offenbach/Main* Postfach 19.—East India Goat skins.

2. Dr. Otto Moesgen & Co., *Kooln* 10 Postfach 60.—Semi tanned East Indian skins.

3. Michel & Wiemer, Haeute und Felle, *Hamburg* 11 Adolphsbruche 10.—Semi tanned East Indian goat and sheep skins.

—Lea. Export Promotion Council Circular.

INDIA'S TRADE WITH SUDAN: SCOPE FOR EFFORT OF LEATHER GOODS

The scope for establishing a potential market for finished Indian leather goods in Sudan was discussed by the members of the Leather Export Promotion Council, Madras, with members of the Sudanese trade delegation now on a visit to the City at a meeting held at the office of the Joint Chief Controller of Imports and Exports in George Town. Mr. R. K. Rangan, Joint Chief Controller of Imports and Exports and Chairman of the Leather Export Promotion Council, welcomed the members and said that at present India was not having much trade with Sudan in hides and skins but with the visit of the delegation and exchange of ideas it was hoped to open out a new era of developing trade in these commodities between the two countries. He said that India was particularly interested in getting raw hides and skins from Sudan and, with her resources, would be in a position to send finished leather and leather goods to Sudan. East India tanned leather, he said, had a name the world over and he requested the delegation to consider favourably the import of finished leather goods from India and export of raw hides from Sudan to India. Mr. Mohamed El Mokkawl Mustafa, Assistant Director, Ministry of Commerce and Industry and Supply, leader of the delegation, explained that there were no trade restrictions by the Government in Sudan, which was a large exporter of hides and skins, as she had no leather manufacturing industry so far.

In the discussion which followed, it was explained on behalf of the Leather Export Promotion Council that there were ample facilities in Madras State for the tanning of hides and skin. Dr. Y. Nayudamma, Acting Director of the Central Leather Research Institute, said that Sudan with a population of 11½ million could become a potential market for finished Indian leather goods and India could import from Sudan raw hides and skins, particularly hides. They could also establish co-operation between the two countries in the matter of tanning on a 50-50 basis. Experts from India could go to Sudan to make an assessment of the industry and suggest ways and means of improving it. Arrangements could also be made for affording training facilities in India for those who would come from Sudan. He suggested that leather goods produced in India be exhibited in Sudan for the benefit of those interested in the trade. With regard to the training of personnel, he said, arrangements would be on Government level. Earlier, Mr. Bakher Ali Khan, Secretary, Leather Export Promotion Council received the members of the delegation. Those present included Messrs. Nazir Hussain, M. J. Jamaluddin and M. K. S. Mohideen and Mr. Navalkishore, Deputy Chief Controller of Imports and Exports, Mr. J. K. Sarkar, Controller, Co-ordination and Export Promotion, Mr. C. S. Ramu, Joint Director of Industries and Commerce, Mr. P. Govinda Menon, Director, Small Industries Service Institute, Mr. E. C. Sankar, Regional Manager, State Trading Corporation and Mr. V. Subramaniam of the Information Department, Government of India.

—The HINDU, dated 18th April, 1957.

WOOL PRODUCTION EXTENSION CENTRES: 399 TO BE OPENED

There will be 396 extension centres for development of sheep and wool production in India by March 31, 1959, at a total cost of Rs. 150 lakhs. The object was to improve sheep breeding and utilisation of wool, and conduct research on cross-breeding and selective breeding with a view to upgrading local sheep with the higher species. Already 24 such centres have been established,—8 each in Uttar Pradesh and Punjab and 4 each in Bombay and Andhra Pradesh in 1956-57. During 1957-58, 166 additional centres would be established—39 in Rajasthan, 25 each in U.P. and Bombay, 16 each in Punjab, Mysore and Jammu and Kashmir, 14 in Madhya Pradesh, 8 in Madras and seven in Andhra Pradesh. During 1957-58, three wool utilisation centres—one each in Uttar Pradesh, Bombay and Rajasthan will be established. A similar number of sheep breeding farms will be set up in Bombay, Himachal Pradesh and Madhya Pradesh, each farm having a wool analysis laboratory as well.

The Union Government had sanctioned a total grant of Rs. 10 lakhs and Rs. 4 lakhs as loan to States for 1957-58 for this purpose.

—*The Mail, 24th April* 1957.

MADRAS FOREST DEPARTMENT TO INCREASE YIELD OF TANNING STUFFS

In a Government note on the Madras Forest Department during the year, the Department has been requested to devote more attention to raising the industrial potential of the State's forests, to yield paper pulp, matchwood, tanning stuffs, essential oils and lac in increasing quantities in the succeeding years.

—*The Mail, 11th April* 1957.

THE CENTRAL LEATHER FOOTWEAR INSTITUTE

The Central Leather Footwear Institute, sponsored by the Government of India for offering training in footwear manufacture is expected to start functioning in Madras in a couple of months.

Claimed to be the first of its kind in the country, the Institute will provide a one-year course of training to 100 persons—craftsmen, supervisory and managerial staff at a time. Five foreign experts who will man the Institute, assisted by their Indian counterparts, are now busy working out details of the syllabus, etc.

The Institute, which will be under the charge of the Development Commissioner (Small Scale Industries), will be located temporarily at the Industrial Estate Buiding in Guindy till a new building of its own is constructed.

It is stated that a similar Institute will be established in Agra later.

—*The Hindu, dated 25th April* 1957.

C. L. R. I. NEWS

Dr. Y. Nayudamma, Assistant Director-in-charge, Central Leather Research Institute, attended the meeting of the Central Arecanut Committee at Mysore from 17th to 21st April 1957.

Shri T. S. Sodhi, appointed as permanent Administrative Officer, Central Leather Research Institute, with effect from 1st April 1957.

Shri K. C. Sundarachari and Shri S. Rajagopal, hitherto Superintendent and Assistant-in-charge respectively, appointed as permanent Section Officers with effect from 1st April 1957.

We welcome Dr. N. Ramanathan who has joined this Institute as Senior Scientific Officer in the Physics Division.

The Executive Council of the Central Leather Research Institute, Madras, met at 3.00 p.m. on Saturday, the 6th April 1957 at the University Buildings, Madras, under the Chairmanship of Dr. A. L. Mudaliar, Vice-Chancellor of the University of Madras.

SCHEMES SANCTIONED

The Governing Body of the CSIR have sanctioned the continuance of the undermentioned schemes at Bengal Tanning Institute, Calcutta for the year 1957-58.

1. Manufacture of upholstery and other special types of leather.
2. Study of the characteristic behaviour of Sunderban Mangroves specially Goran.
3. Microscopical data and standard specification of vegetable tanned sole leather.

The Governing Body of the CSIR have sanctioned the following new schemes.

1. " Studies on the shrinkage temperature of hides and leathers " by Prof. B. N. Ghosh, University College of Science, Calcutta.
2. " Action of leather on photographic emulsions " by Prof. V. P. Narayana Nambiar, Pachaippa's College, Madras.

PRACTICAL DEMONSTRATION No. 3. The fourth item in the series of the processes for practical demonstration viz. " Manufacture of picking bands " which was started on 5th April 1957 came to a close by the first week of May 1957.

PRACTICAL DEMONSTRATION No. 4. The next process for practical demonstration on " Manufacture of Suedes and lining leathers from E.I. Goat " was started on 15th May 1957.

The following Tanners' representatives attended the Practical Demonstration No. 3 " Manufacture of Picking Band Leather " which was conducted during 5th April to 14th May 1957.

1. Shri P. S. Choudary, Messrs. General and Industrial Leathers (Private) Ltd., Thiruvottiyur, Madras.
2. Shri C. M. Pothiwala, Messrs. Jai Hind Leathers (Private) Ltd., Ahmedabad.
3. Shri M. Y. Malik Borda, M/s. Madras Chrome Tannery, Pallavaram.
4. Shri P. E. M. Krishnan, 78, C. P. Koil Street, Madras-14.
5. Shri G. M. Malim, 43, Chinna Kadiathan, S-43 Jalam Bahrim, Kulai-Johone, Malaya.
6. Shri J. B. Jamal Ahmed, M/s. J. A. Jamal Bukhari, Kannayut Tannery, Kannayut, Burma.
7. Shri R. Kalyanasundaram, Messrs. Chrome Leather Co. (Private) Ltd., Chromepet P.O.
8. Shri K. M. Shaffullah Baig, The Madras Chrome Tannery, Madras.
9. Shri M. R. Joseph, Messrs. M.L.J. & Co., Pallavaram.
10. Shri K. M. Varghese, Chrome Leather Co. (Private) Ltd., Chromepet.
11. Shri A. Mohamed Mian, Messrs. N.M. Tannery, Palakkarai, Tiruchirapalli.
12. Shri A. K. Das Gupta, M/s. Northern India Tanneries (Private), Ltd., Kapurthala.

Some OBSERVATIONS ON THE PRACTICAL DEMONSTRATIONS BY THE PARTICIPANTS.

Chrome retan process :

" This process will help most of the manufacturers to switch their production to this line ".

" A very interesting tanning process that will serve a long felt want of the trade. A step in the right direction for the improvement of the finished leather production in the country ".

Rapid tannage of sole leather :

" Much impressed by the short process of sole leather, carried out here ".

" Such demonstrations are really rendering a great help to the country ".

" Benefited very much by attending ' Sole Leather Demonstration ' ".

RESEARCH BEARS FRUIT

PRACTICAL DEMONSTRATION No. 5

Process : Manufacture of Glace Kids.

Period : 5th June to 10th July 1957.

Place : Central Leather Research Institute, Adyar, Madras-20.

Sir,

You are now fully aware that the processes developed by research at great cost at this Institute are being practically demonstrated to the tanners every month. The fifth in this series, viz. Manufacture of Glace Kid, will be demonstrated from 5th June 1957 to 10th July 1957 at this Institute.

Glace Kid is a high class leather, manufactured from goat skins by the chrome tanning process for the use of high-class ladies' shoes etc.

India produces about 22.5 million pieces of goat skins annually and 80% of this valuable raw material is exported in the raw form mainly to the U.K. and U.S.A., fetching about 80 million rupees. If this exported raw material is converted into finished leathers in India, the value of this industry will be trebled, resulting in 240 million rupees.

Recognising the great economic importance of this glace kid industry, the Central Leather Research Institute has conducted painstaking researches and developed 12 different processes for the manufacture of quality glace kid leathers. The research worker engaged in this project was sent to the United States to get himself fully trained in the latest trends and techniques of the manufacture of glace kid leather. Two of the processes developed by this competent research worker will be demonstrated.

If you are interested in this line of work, you are most welcome to send your representative to get himself fully trained in the manufacture of glace kid leather. Arrangements have been made at this Institute for boarding and lodging of the participants.

Please let us know the name of your representative who will participate in this demonstration.

Yours faithfully,
Sd. Y. NAYUDAMMA,
Asst. Director-in-charge.

PROGRAMME

PROCESS-1. MANUFACTURE OF GLACE KID BY ONE BATH CHROME TANNING-METHOD.

Raw Material : Wet salted Erode quality goat skin.

5th, 6th June 1957 : Soaking in paddle for 3 hours and pasting for unhairing.

7th to 10th June : Unhairing and liming in paddle.

11th June : Fleshing, scudding, washing and bating in paddle overnight.

12th June : Bating, scudding, washing and pickling in drum overnight.

13th to 16th June : One bath chrome tanning and piling up on the platform.

17th June : Sammying and shaving.

18th June : Neutralising, dyeing, fatliquoring and horsing up overnight.

19th June : Striking out, oiling up, sammying, setting and drying.

20th to 23rd June : Taking down and stored up for conditioning.

24th June : Damping in sawdust overnight.

25th June : First staking and piling up on the floor overnight.

26th June : Second staking, drying and buffing.

27th June : Trimming and Ironing.

28th June : Bottom seasoning and drying.

29th June : Sun drying and 1st glazing.

1st July : Top seasoning, fixing and drying.

2nd July : Sun drying, 2nd glazing, light pressing and measuring.

3rd July : Ironing, grading and packing.

PROCESS 2. MANUFACTURE OF GLACE KID BY TWO BATH CHROME TANNING METHOD.

Raw material : Wet salted Erode quality goat skin.

12th to 16th June 1957 : Soaking in paddle for 3 hours and pasting for unhairing.

17th June : Unhairing and liming in paddle for one day.

18th June : Fleshing, scudding, washing and bating in paddle overnight.

19th June : Bating, scudding, washing and chroming overnight.

20th June : Chroming and horsing up overnight.

21st to 23rd June : Reducing and left in the bath overnight and piling up next day.

24th June : Sammying and shaving.

25th June : Neutralising, dyeing, fatliquoring and horsing up.

26th June : Striking out, oiling up, sammying, setting and drying.

27th to 30th June : Taking down and stored up for conditioning.

1st July : Damping in sawdust overnight.

2nd July : First staking and piling up overnight.

3rd July : Second staking, drying and buffing.

4th July : Trimming and Ironing.

5th July : Bottom seasoning and drying.

6th July : Sun drying and 1st glazing.

8th July : Top seasoning and fixing, drying.

9th July : Sun drying, 2nd glazing, Light pressing and measuring.

10th July : Ironing, grading and packing.

VISITORS

Name.	*Date of visit.*
Prof. A. D. Bohra, M.I.S., Director, Ministry of Commerce Division, New Delhi ..	2—4—1957
Shri V. Padmanabhan, Deputy Director of Industries & Commerce, Madras ..	2—4—1957
Shri D. C. Karaka, Pickers Ltd., Ahmedabad ..	2—4—1957
Dr. D. L. Shrivatsava, Deputy Director, Central Drug Research Institute, Lucknow ..	5—4—1957
Shri K. N. Mathur, Deputy Director, National Physical Laboratory, New Delhi ..	5—4—1957
Members of the Australian Trade Delegation headed by Mr. John G. Hurley ..	5—4—1957
Shri G. G. Takle, Inspector of Forests, Government of India ..	6—4—1957
Shri P. Govindan Nair, Minister (Economics), Washington ..	6—4—1957
Mr. N. F. Mason of the Cooper Allon Branch, Kanpur.	8—4—1957
Shri C. S. Shah, President, All India Leather, Goods Manufacturers' and Dealers' Association, Bombay ..	8—4—1957
Members of the Sudanese Trade Delegation headed by Mr. M. E. M. Mustafa ..	18—4—1957
Mr. U. A. Ricker, Adviser for Shoe Industry, Central Footwear Technology, Madras ..	24—4—1957
Mr. John Asmusse, Footwear Expert ..	24—4—1957