LETTERS TO THE EDITOR

Vegetable tannins as raw materials for the manufacture of syntans

Generally, phenol is the most commonly used raw material for the manufacture of syntans. However, with the increase in the use of phenol in a number of industries, there has been a tendency to replace phenol, as a raw material, for the manufacture of syntans. One such promising raw material is vegetable tannins. Most of the vegetable tanning materials, excepting wattle and quebracho, are not useful as self-tanning materials as they are associated with certain common defects like hydrolysis of tannins, formation of 'sludge or bloom', fermentation, mould growth etc. in the case of hydrolysable tannins and polymerization resulting in the formation of 'phlobaphenes or tannin-reds', giving dark coloured extracts due to the presence of colouring matter like anthocyanidins, quinones etc. in the case of condensed tannins. It is these defects that are limiting the use of these materials as self-tanning materials. Tannins from such defective tanning materials can be used as raw materials for the manufacture of syntans. Available literature in this aspect is scanty except the cationization of vegetable tannins.[1,2] Preliminary studies carried out in our laboratory led to the development of a syntan using tannins from myrobalan (*Terminalia chebula*) nuts.[3] In the present studies using tannins from deoiled sal (*Shorea robusta*) seeds, myrobalan (*Terminalia chebula*) nuts and divi divi (*Caesalpinia coriaria*) pods—all hydrolysable tannins—three syntans were prepared. As there were some difficulties experienced during the neutralization of these products with mineral acids, the syntan was neutralised with "Neutritan", specially developed for this purpose.

The method can be applied for the preparation of syntans using other hydrolysable tannins like valonea, algarobilla, sumach, teri pods, arjuna pods etc. During this process, the defects associated with these tanning materials are minimised. Tanning studies carried out using the developed products gave good results as retanning syntans. The additional advantage with these syntans is that they gave leathers having the combined property of both vegetable tannins and syntans during retanning.

Experimental

Preparation of extracts

The plant material (deoiled sal seeds, myrobalan nuts, divi divi pods) (each 1 kg) was separately extracted with water (4 x 5 lit), each time the extraction being done for 6 hours at 4 different temperatures : (i) 56-60°C, (ii) 65-70°C, (iii) 80±5°C and (iv) 95-100°C (in the case of deoiled sal seeds the fourth extraction was done at 80±5°C). The combined extracts in each case was concentrated separately to 25% solids and used for the preparation of syntan.

Preparation of syntan

The vegetable tannin extract was mixed with the catalyst (3 N hydrochloric acid), urea and formaldehyde and stirred for 10 min. The mixture was then heated for 1 hour and 10 min under stirring and cooled to 50-55°C.

The above mixture was then treated with sodium hydroxide, stirred for 5 min and sulphomethylated with sodium sulphite and formaldehyde, added during 10 min. The mixture was then heated for 3 hours and 10 min on a water bath, with stirring and

	Extract	*Catalyst*	*Urea*	*Formaldehyde (37% solution)*	*Sodium hydroxide*	*Sodium sulphite*	*Formaldehyde (37% solution)*
Myrob	100 g	0.45 ml	3.125 g	11.25 g	1.88 g in 4.38 ml water	15 g	27.5 g
Deoiled Sal	100 g	0.45 ml	3.125 g	11.25 g	1.88 g in 4.38 ml water	12 g	22.0 g
Divi Divi	100 g	0.45 ml	6.250 g	22.50 g	3.75 g in 8.75 ml water	30 g	55.0 g

neutralised with neutritan.

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REFERENCES

1. Kuntzel, A., & Rosenbusch, K., *Leader*, 5, 50 (1954).

2. Vago, G., Paper Presented at the *'Seminar on Vegetable tannins' (CLRI)* (Ed. Rajadurai, S., & Bhanu, K. U.) 21–23 Jan. 1962 p. 145.

3. Sastry, K.N.S., Sundara Rao, V.S., Shanmuga-sundaram, K.A., Vijayaramayya, T., Reddy K.K., & Santappa, M., paper presented at the *13th Tanners' Get-together, 1978*, CLRI