Thus it may be concluded that all the amides behave as monodentate ligands and are bonded to titanium *via* oxygen atom. In all the monodentate substitution reactions, there occurs no rupture of the polyhydric phenolic linkages.

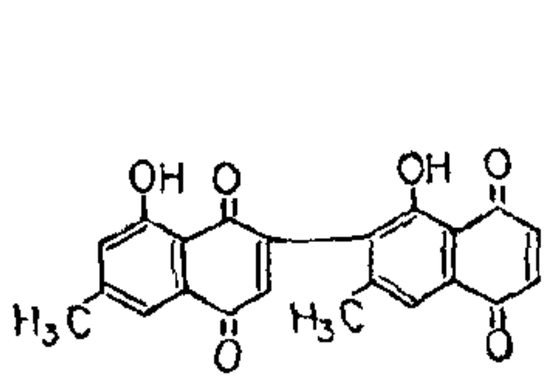
Department of Chemistry, M. K. RASTOGI.
Hindu College, Delhi 110007,
September 26, 1977.

1. Levy, L., *Ann. Chim.* (*Phys.*), 1892, **25**, 433.
2. Gopi Nath and Gupta, J., *Indian J. Chem.*, 1965, **3**, 231; 1966, **4**, 374.
3. Kuhn, L. P., *J. Am. Chem. Soc.*, 1952, **74**, 2492.
4. Ingrahm, L. L., Corse, J., Bailey, G. F. and Stitt, F., *J. Am. Chem. Soc.*, 1952, **74**, 2297.
5. Richards, R. E. and Thomson, H. W., *J. Chem. Soc.*, 1947, 1248.
6. Randall, H. M., Fowler, R. G., Fuson, N. and Dangl, J. R., *Infrared Determinations of Organic Structures*, Von Nostrand, Princeton, New Jersey, 1949.
7. Penland, R. B., Mizushima, S., Curran, C. and Quagliano, J. V., *Spectrochim. Acta*, 1957, **79**, 1575.
8. Hadzi, D. and Sheppard, N., *Trans. Faraday Soc.*, 1954, **50**, 911.
9. Randall, R. R. and Whiffen, D. H., *Molecular Spectroscopy*, Pergamon Press, New York, 1955.
10. Davies, M. and Jones, R. L., *J. Chem. Soc.*, 1954, 120.
11. Rao, C. N. R., *Chemical Applications of Infrared Spectroscopy*, Academic Press, New York and London, 1963.
Bellamy, L. J., *The Infrared Spectra of Complex Molecules*, Mathuen and Co. Ltd., London, John Wiley and Sons, Inc., New York, 1964.

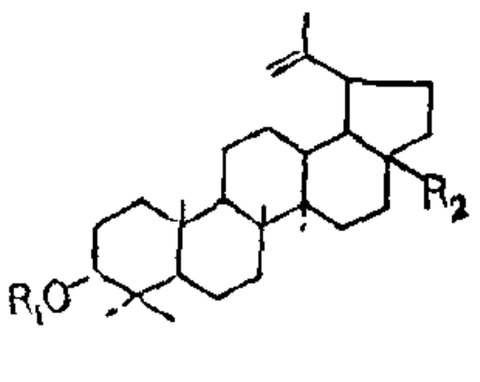
CHEMICAL EXAMINATION OF DIOSPYROS SPECIES :

IN a scheme to study the triterpenes of Diospyros species,[1-4] the chemical components from the leaves of *D. montana* Roxb., are reported in this communication. The leaf powder (1 kg) was extracted with benzene to effect a better separation of the quinonoid material from triterpenoids. Benzene extract upon concentration under vacuum followed by cooling deposited a dark red solid [5](1 g). It crystallised as brick red microneedles from benzene, m.p. 255° (600 mg). It gave an intense violet colouration with aqueous alkali which faded away ; and gave reddish brown ferric colour. On reductive acetylation it furnished a colourless crystalline leucoacetate, m.p. 222°. The physical characteristics of the quinone as well as its leucoacetate, closely resembled those of diospyrin (I) and a direct comparison (mmp and IR) with an authentic sample confirmed the identity.

Further concentration of the benzene extract deposited colourless solid (3 g) which was separated into neutral and acidic fractions. The neutral fraction crystallised from methanol as colourless silky needles, m.p. 210–212°, undepressed by an authentic sample of lupeol (II : $R_1 = H$, $R_2 = Me$), $[\alpha]_D + 39°$. The identity was further conformed by preparing its acetate $C_{32}H_{52}O_2$, m.p. 210–212°, $[\alpha]_D + 45°$ (II: $R_1 = Ac$, $R_2 = Me$) and a benzoate, $C_{37}H_{54}O_2$, m.p. 272–274°, $[\alpha]_D + 60°$ (II : $R_1 = Bz$, $R_2 = Me$).



I



II

The acid fraction crystallised from chloroform-methanol, as colourless needles, mp. 298–300°, undepressed by admixture with authentic betulic acid (II: $R_1 = H$, $R_2 = COOH$), $[\alpha]_D + 5°$. It gave an acetate, $C_{32}H_{50}O_4$, m.p. 284–286°, $[\alpha]_D + 20D$ (II: $R_1 = Ac$, $R_2 = COOH$), methyl ester $C_{31}H_{50}O_3$, m.p. 220–222°, $[\alpha]_D + 50°$, (II : $R_1 = H$, $R_2 = COOMe$) and a methylester acetate, $C_{33}H_{52}O_4$, m.p. 198–200°, $[\alpha]_D + 19°$ (II: $R_1 = Ac$, $R_2 = COOMe$).

The mother liquors from neutral and acidic fractions showed some more spots on T.L.C. and their separation and characterisation is under progress.

The isolation of Diospyrin (I) from the leaves of *D. montana* is the second instance where the leaves contained the poisonous naphthaquinones, the first being recorded by Cook *et al.*[5].

The authors thank Dr. G. S. Sidhu, Director, R.R.L., Hyderabad, for an authentic sample of Diospyrin.

Department of Chemistry, G. K. A. S. S. NARAYAN.
Andhra University, L. R. ROW.
Waltair 530 003, P. SATYANARAYANA.
November 23, 1977.

1. Ramachandra Row, L., Sankara Rao, C. and Sundara Ramaiah, T., *Curr. Sci.*, 1964, **53** (12), 367.
2. – , — and —, *Ibid.*, 1966, **35** (18), 457.
3. – , — and – , *Ibid.*, 1966, **35** (18), 458.
4. – , — and – , *Indian J. of Chem.*, 1969, **7** (3), 204.
5. Cook, R. G. and Dowd, H., *Aust. J. Sci. Res.*, 1952, **5**, 760.