the formation of MnO_2. The weight loss at 500°–550° C probably indicates the conversion of MnO_2 to Mn_2O_3 as given in literature. Investigations on vinyl polymerization initiated by this compound are under progress.

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1. Cartledge, G. H., *J. Am. Chem. Soc.*, 1951, **73**, 4416.
2. — and Ericks, W. P., *Ibid.*, 1936, **58**, 2061.
3. Taylor, J. F., *J. Biol. Chem.*, 1940, **135**, 569.
4. Yoshino, Y., Ouchi, A., Tsunoda, Y. and Kojima, M., *Can. J. Chem.*, 1962, **40**, 775.
5. Andrulis Jr. P. J., Dewar, M. J. S., Dietz, R. and Hurt, R. L., *J. Am. Chem. Soc.*, 1966, **88**, 5473.
6. Maria, B. and Loana, A., *An. Univ. Bucharesti, Ser. Stiint, Natur. Chim.*, 1969, **18**, 65.
7. Edward, J., Monika, K. and Czelaw, W., *Rocz. Chem.*, 1972, **46**, 731.
8. Okimoto, T., Takahashi, M. and Inaki, Y., *Angew. Makromol. Chem.*, 1974, **38**, 81.
9. Frackler, J. P. and Chawla, I. D., *Inorg. Chem.*, 1964, **3**, 1130.
10. Brannon, D. G., Morrison, R. H., Hall, J. L., Humphrey, G. L. and Zimmerman, D. N., *J. Inorg. Nucl. Chem.*, 1971, **33**, 981.

POLYMETALLIC MINERALISATION IN LADAKH GRANITE, INDUS SUTURE ZONE, LADAKH, INDIA

THE *present note records, for the first time, polymetallic* sulphide and titaniferous-magnetite mineralisation in Ladakh Granite batholith which runs parallel to the Indus Suture Zone, Ladakh, India[1–2].

Preliminary field investigations carried out in the area by one of the authors (K. K. S.) suggest structural doming of the Ladakh Granite between Upshi and Kiari in the east and Khalsi and Garkon in the west, where the Indus river has carved deep narrow valleys, exposing the core portion of the batholith.

The polymetallic sulphide mineralisation is mainly restricted to the pink porphyritic granite near Hanu, west of Khalsi, whereas the titaniferous-magnetite mineralisation is confined to the leuco-granite, occupying the core zone of the Ladakh batholith near Gaik, east of Upshi[3–4]. The mineralisation in the former seems to be quite promising and occurs in the form of veins along fractures and shear zones and as thin films along smooth joint surfaces in the granite.

On the basis of the microscopic studies the following ore minerals have been identified: chalcopyrite, chalcocite, pyrite, galena, malachite and azurite. Reflectance measurements made on these ore samples also suggest the presence of native copper and palladium (?).

Two grab samples were picked up from a 30 cm thick mineralised vein striking NW–SE near Hanu. Preliminary chemical analyses on these samples have yielded 10·2% and 9·6% Pb; 1·6% and 3·6% Cu, respectively.

In the light of the available data on the known mineral occurrences from subduction zones, the world over, it is expected that such zones may yield polymetallic mineralisation. The geological observations in a part of the Indus Suture Zone of Ladakh area indicate the presence of ophiolitic melange and blue schist facies metamorphism which have supported Gansser's earlier contention that the Indus Suture Belt represents a subduction zone[5–8]. The present discovery of polymetallic mineralisation in the Ladakh Granite has a special bearing as this confirms to the idea that suture zones are prospective zones of polymetallic mineralisation. It is possible that such zones of subduction may have been repeated in space and time during the long history of the Himalayan Orogen. This phenomenon confirmed by the detailed geological investigations, being carried out by the Wadia Institute of Himalayan Geology, would not only throw light on the nature of such zones, but may lead to the discovery of new mineral deposits of economic importance in the Indus Suture Zone.

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1. Gansser, A., *Geology of the Himalayas*, Interscience Publishers, London, 1964.
2. —, *Eclogae Geol. Helv.*, 1966, p. 59.
3. Sharma, K. K. and Gupta, K. R., *Recent Researches in Geology*, 1978, 6 (in press).
4. Gupta, K. R. and Sharma, K. K., *Photonirvachak*, 1978, 6 (in press).
5. Shah, S. K., *Himalaya*, C.N.R.S., Paris, 1976, **268**, 361.
6. Gansser, A., *Ibid.*, 1976, **268**, 181.
7. Frank, W., Gansser, A. and Tremsdorff, V. J., *Schweiz. Mineral Petrgs. Mitt.*, 1977, **57**, 89.
8. Virdi, N. S., Thakur, V. C. and Kumar, S., *Him. Geol.*, 1977, **7**, 480.