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1. Caldwell and LeFevre, *J. Chem. Soc.*, 1939, 1614.
2. Knaggs, I. E. and Lonsdale, K., *Nature (London)*, 1939, 143, 1023.
3. Rasmussen, R. S., Tuncliff, D. D. and Brattain, R. R., *J. Amer. Chem. Soc.*, 1961, 71, 1068.
4. Sterk, H., *Monatsh Chem.*, 1968, 999, C.A. 69:14261x.
5. Bernal, I., *Nature (London)*, 1963, 200, 1318.
6. Subrahmanyam, B. and Subba Rao, N. V., *Indian J. Chem.*, 1970, 8, 33.
7. Carlos, F. G. G. Beraldes and Victor Gill, M. S., *J. Chem. Phys.*, 1973, 59, 1171.
8. Cureton, P. H., LeFevre, C. G. and LeFevre, R. J. W., *J. Chem. Soc.*, 1961, 4447.
9. Subrahmanyam, B., Thesis, 1970.
10. Bellamy, L. T. and Williams, R. L., *J. Chem. Soc.*, 1957, 4294.
11. Subrahmanyam, B., Venkateshwarlu, G., Patnaik, D. D. and Padmavathi Reddy, E., *Proc. Indian Acad. Sci.*, 1980, 89, 219.

OCCURRENCE OF HIGHLY ACIDIC GROUNDWATER IN MULUG TALUK, WARANGAL DISTRICT, ANDHRA PRADESH, INDIA

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DURING the hydrogeological inventory in the Lower Maner Basin in Warangal district, Andhra Pradesh, an interesting occurrence of highly acidic groundwater was encountered.

The source of the groundwater sample was an open well belonging to Shri D. Chinna Mallaiah in the village Tachindlapet (18° 09' 49" N; 80° 00' 46" E) locally known as Kasimdevpet in Mulug Taluk, Warangal district, Andhra Pradesh. The well is located in a topographic low in shale formations and is circular in shape with a diameter of 8.4 m. It is lined with stone work down to 8.5 m below ground level

(BGL) The total depth of the well was 8.5 m BGL. The water table was around 5 m BGL. The water had a greenish yellow colour and sulphur smell. Sulphur encrustation was seen around the well. Other available wells examined in the area showed a pH of 7.5 to 7.8, whereas the well waters under question are highly acidic.

The formations encountered in the well as well as in the environs are Mulug shales within the Mulug Group of Pakhal Super Group (Upper Pre-Cambrian). The shales are dark grey, laminated and micaceous. Occasional graphitic material was also seen. The shales exhibit weathering along bedding and joint planes.

The well was excavated for irrigation purpose. However, the plants could not be grown and frogs were also seen to die in this water.

A water sample was collected on 1.2.1975 and analysed at the site for pH and other perishable ions. Stable ions were later determined in the laboratory. The analytical results are given in table 1. Repeat analysis of a water sample collected on 10.5.1984 from this well gave a pH of 3.1 and EC of 4840 micromhos at 25°C.

Table 1 Chemical character of the acid water from a dug well in Tachindlapet

pH	: 3.2	Chloride	: 113 mg/l
Temperature	: 26 C	Sulphate	: 3122 mg/l
E.C. in micromhos, cm at 25°C	: 4177	Fluoride	: 3.1 mg/l
Total hardness as CaCO ₃	: 955 mg/l (mg litre)	Calcium	: 201 mg/l
		Magnesium	: 110 Mg/l
Total acidity as CaCO ₃	: 1013 mg/l	Sodium	: 540 mg/l
Carbonate	: Nil	Potassium	: 4.5 mg/l
Bicarbonate	: Nil	Iron	: 0.42 mg/l
		Silica	: 116 mg/l

From the analysis, it is inferred that pyrite which was available in the shales was getting oxidised and in the process releasing sulphurous acid. The sulphurous acid is further oxidised to sulphuric acid. Other wells in the area (nearest one was 800 m away towards NW), however, showed a pH of 7.5 to 7.8. Because this was an isolated case of such highly acidic waters, it is surmised that a local enrichment of sulphide minerals may have contributed to this acidity.

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