

**DISCOVERY OF URANINITE IN
THE PRECAMBRIAN BASIC ROCKS OF
BODAL, RAJNANDGAON DISTRICT,
MADHYA PRADESH, INDIA**

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THE occurrence in and around Bodal (Survey of India Toposheet No. 64D/14; 29° 39' 00" : 80° 45' 50"), Rajnandgaon District, Madhya Pradesh of uranium mineralisation in basic rocks composed of hornblende, quartz, and biotite has recently been reported by Sen¹. The purpose of this note is to present the results of an ore-mineragraphic study aimed at characterising the precise nature of this very unusual mineralisation (uranium in a basic rock).

Methods of Study

Polished sections of the rock were prepared on a Kent Mark II automatic polishing machine using various grades of diamond paste on a synthetic unwoven fibre disc. The sections were investigated on incident light Leitz Orthoplan MPV microscope fitted with a photomultiplier tube for reflectivity measurements which were made using sodium light.

Ore Mineralogy

The ore-assemblage of the basic rock comprises ilmenite (FeTiO_3), rutile (TiO_2), pyrrhotite ($\text{Fe}_7\text{S}_8\text{-FeS}$), marcasite (FeS_2), pyrite (FeS_2), pentlandite [(Fe, Ni)S], chalcopyrite (CuFeS_2), sphalerite (ZnS), and uraninite (U_3O_8) in that order of abundance. Pyrite is found altering to marcasite which in turn is replaced by chalcopyrite and sphalerite forming a fine granular network along the cleavage of marcasite. Pyrrhotite is replaced by both chalcopyrite and pentlandite. The fox-red colour of pentlandite observed at places suggests that this ore may have some silver in solid solution.

Characteristics of Uraninite

Uraninite occurs in clusters of ultrafine grains that show a fragmented appearance (Figs. 1 and 2). The uraninite grains ranging in size from 1 to 8 microns are invariably surrounded by amphiboles. The presence of uranium in the ultrafine granular clusters has been confirmed by chromatographic spot tests using photographic paper, hydrochloric acid, and potassium ferricyanide.

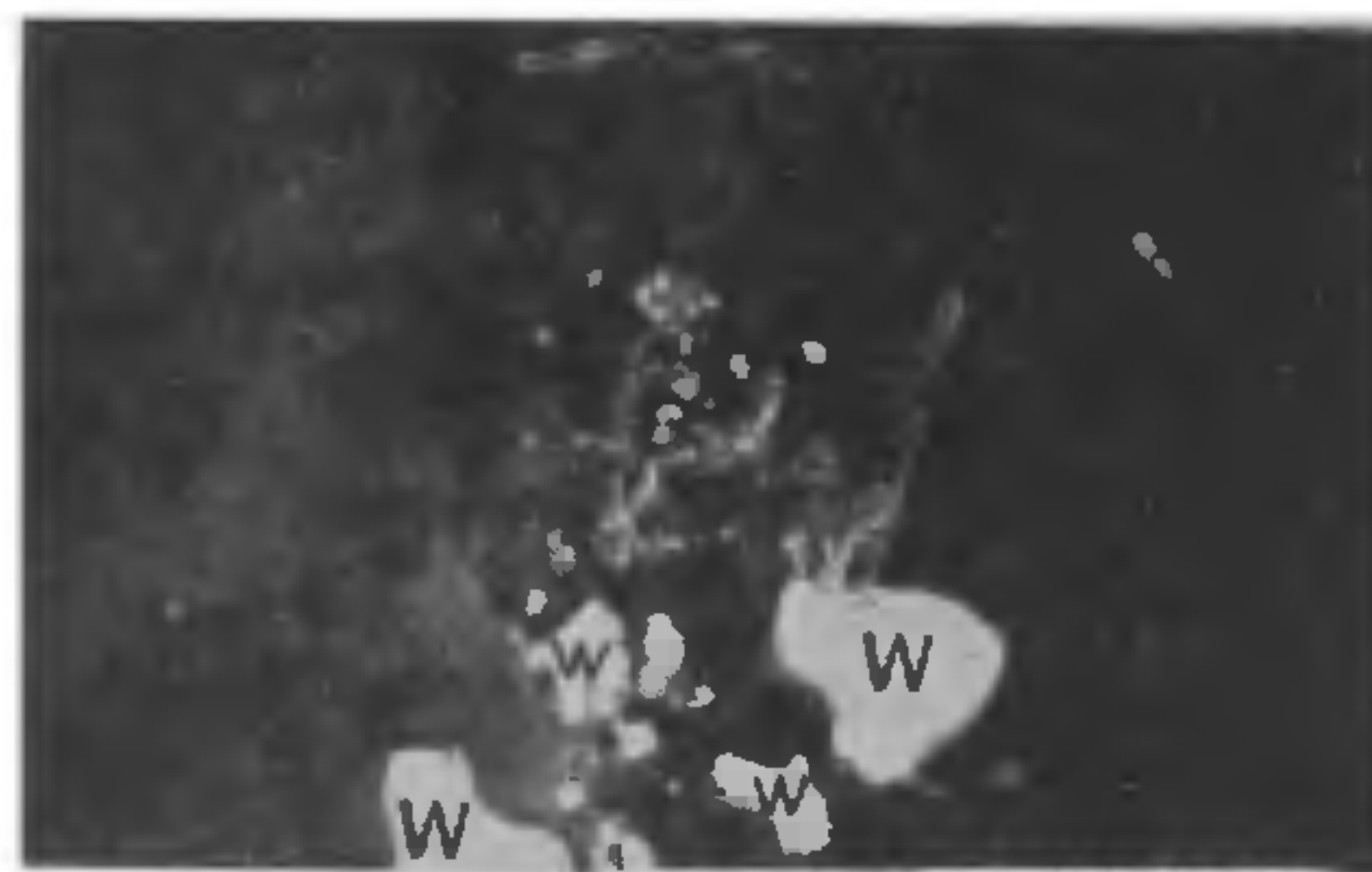


FIG. 1. Photomicrograph of basic rock showing clusters of ultrafine grains of uraninite (grey) and pyrrhotite (white, W), $\times 600$.



FIG. 2. Photomicrograph of basic rock showing fragmented clusters of ultrafine uraninite grains (grey) pyrrhotite (white, W), and ilmenite (isolated, scattered grains), $\times 600$.

Suspected Presence of Electrum

Some very minute grains, 0.6 to 0.9 micron in size, of white to bright yellow colour, with a reflectivity of 70%, are suspected to be of electrum (an alloy of gold and silver). The extremely fine size of these grains combined with their rarity in the rock precluded confirmatory tests by other techniques involving separation of electrum from the rock.

Conclusion

The occurrence of uraninite in basic rock of Bodal reported here appears to be the first of its kind to be recognized in the Precambrian of India.

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1. Sen, D. B., *Curr. Sci.*, 1977, 46, 605,