

## **Siderite Hosted Copper Sulphide Mineralisation In Palaeozoic Sequence Of East Himalaya, Bhutan**

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Stratabound manganoan siderite bands along the interface of carbon phyllite and lithic wacke host significant concentration of copper rich sulphides within the Tethyan Palaeozoic sequence of Black Mountain region, Bhutan Himalaya. The Gongkhola deposit having limited economic potential, is by far the best located in the Himalaya and unique in geological setting. The associated litho-assemblage includes fossiliferous calcareous psammopelites, impure quartzite and wacke, very coarse debri flow unit, shale-phyllite, and minor tuffs, representing distal rapid sedimentation with frequent basinal instability during Middle to Upper Ordovician time. The rocks display low green schist facies metamorphism and two distinct phases of fold deformation.

The principal sulphides are chalcopyrite, pyrite, pyrrhotite, arsenopyrite, galena and sphalerite. The mineralisation abounds in the coarse sideritic bands and also in quartz siderite veined quartzite/wacke near the contact. Bedding laminates and schistosity parallel blebs and streaks of pyrite-pyrrhotite occur in the carbon phyllite and wacke. Despite overall concordance of ore bodies, local transgressive features are common. An initial sedimentary-diagenetic phase of siderite and sulphide mineralisation followed by partial mobilisation at tectono-metamorphic stage constitute the basic tenets of ore genesis. The possible roles of physico-chemical instability in the basin due to rapid debri discharge, diagenetic processes, and volcanogenic additives are critically considered to decipher the source of ore forming fluids.