MINERAL ASSEMBLAGES IN DIAGENETIC AND LOW GRADE METAMORPHIC IRON FORMATION OF BADAMPAHAR AREA,ORISSA ,INDIA.

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BIF constitute a key horizon in the Archaean schist belt of Badampahar-Gorumahisani basin underlain by cherty quartz arenite and intruded by granite,dolerite and ultrabasic in the north Orissa, Eastern India.Mineralogy and petrographic features document that BIF comprise of magnetite,martite, grunerite and quartz. The elegant preservation of sedimentary banding and soft sediment deformational features despite over-printing by metamorphic events is a striking phenomenon. The prelithification features are the desiccation cracks,scour-and-fill,slump structure etc.Magnetite,the monomineralic primary iron oxide and silica as chert form the rhythmites.Magnetite occurs as minute crystals of large octahedra.Magnetite was plausibly precipitated from hydrated ferric oxide solution (precursor material) in a thermodynamic system in chemical equilibrium condition where supply of oxygen was low and medium was alkaline and at low temperature.It is recrystallised often forming large grains. Decrease in free energy due to change in chemical system led to recrystallisation of mega-crysts.Magnetite is replaced by martite leaving vestiges of magnetite.Martitisation took place under post- metamorphic oxidising conditions.Appearance of grunerite indicates upper low grade metamorphic condition. The grunerite is formed by reaction of magnetite and quartz under metamorphism induced due to intrusion of mafic dykes in to the BIF.