

GEOCHEMISTRY AND PETROGENESIS OF AMGAON GNEISSES OF CENTRAL INDIAN CRATON

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The Amgaon gneisses of early Proterozoic age have a considerable areal extent in Central India. They broadly depict tonalite to granite composition and can be divided into two groups, one predominantly tonalitic and the other predominantly adamellitic. The tonalite group is characterised by higher Al_2O_3 , CaO , Na_2O , $\text{Na}_2\text{O}/\text{K}_2\text{O}$, Sr ; and lower K_2O , Rb , Rb/Sr and total REE and significant positive Eu anomaly while the adamellite group shows lower Al_2O_3 , CaO , Na_2O , $\text{Na}_2\text{O}/\text{K}_2\text{O}$, Sr and higher K_2O , Rb , Rb/Sr and total REE and negative Eu anomaly. The two groups show metaluminous ($\text{A}/\text{CNK}=0.71$ to 1.33 , $\text{Av.} = 0.91$) and peraluminous ($\text{A}/\text{CNK} = 0.8$ to 1.23 , $\text{Av.} = 1.11$) character respectively. Though normalised REE patterns for both groups are similar, they differ considerably in Eu anomaly (tonalite group $\text{Eu}/\text{Eu}^* = 1.03$ - 3.06 ; adamellite group $\text{Eu}/\text{Eu}^* = 0.14$ - 0.90) and total REE contents (8 - 172 ppm and 25 - 824 ppm respectively). Both the gneissic groups exhibit I-type chemical signatures and tectonic setting similar to volcanic-arc granites. It is suggested that both the groups were derived by partial melting of early amphibolite crust. The tonalite group with +ve anomaly and metaluminous character represents the plagioclase enriched partial melt of the amphibolite while the adamellite group of gneisses is the fractionate. Their composition appears to have been readjusted to some extent by Sakoli group of sediments.