

Mineral zones of the Anglesey glaucophanitic metamorphic belt, UK

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Since the first discovery and detailed descriptions of the Anglesey glaucophane schists, in UK (Greenly, 1919), the structural (Shackleton (1954, 69, 75), and mineralogical studies (Gibbons, 1981, 1983, 1986, 1991) have been completed. Yet, the regional distribution of key minerals have not yet been fully investigated. We have collected 250 samples systematically in this belt, and examined those mineral assemblages.

Based on the mineral assemblages in metabasites, the following three mineral zones were identified. Zone I is defined by the epidote-chlorite with excess albite, quartz, phengite, sphene with or without calcite. In Zone II, crossite appears coexisting with epidote, chlorite, albite and quartz, with minor phases same as in Zone I. Zone III is defined by the presence of barrosite to green hornblende together with Al-epidote, chlorite, albite, quartz with minor phases same as in Zones I and II. The metamorphic grade ranges from sub-greenschist facies (Zone I) through glaucophane schist facies (Zone II) to epidote-amphibolite facies (Zone III).

Mineral assemblages in pelitic to psammitic schists, though minor in amounts, are simple, graphitic materials, phengite, calcite, albite and quartz in all zones, except garnet in Zone III.

The protoliths of this metamorphic belt, is B-type, i.e., accretionary complex, in origin, and comparable to the circum-Pacific type, and quite different from the Appalachian-Dalradian-Norwegian collision type orogen. The Ar-Ar ages of phengitic micas range 550-560Ma (latest Proterozoic; Dallmeyer and Gibbons, 1987) suggest that the Pacific-type orogeny prevailed to increase the continental crust along the western margin of Baltica before the final collision with respect to N. America in the Iapetus Ocean.