Workshop

LE GEOSCIENZE E IL CICLO DEL CARBONIO

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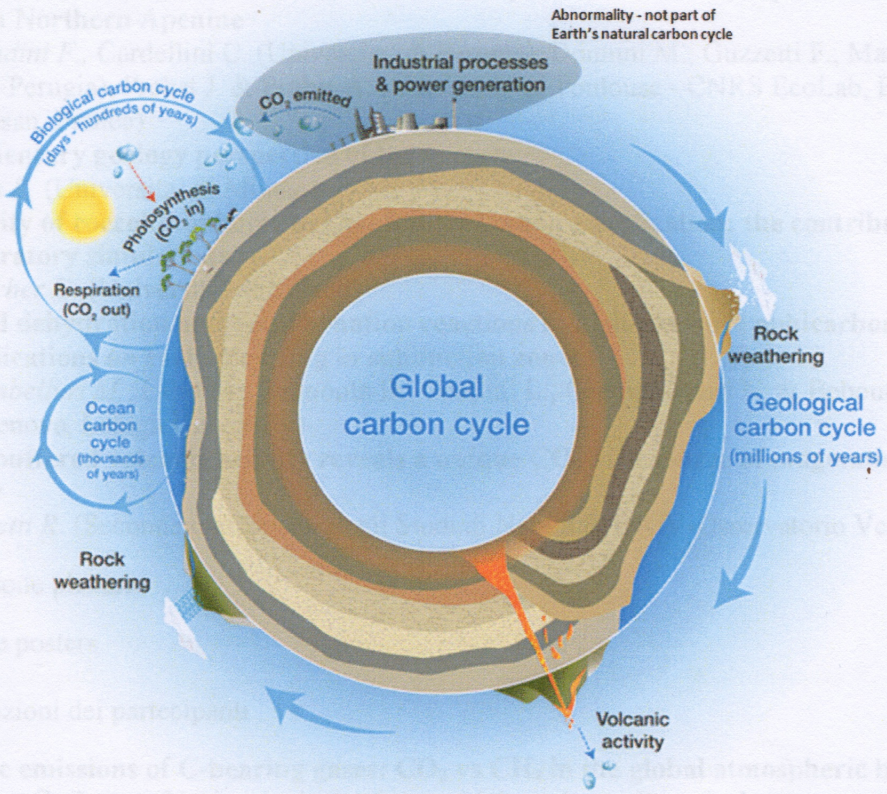
Dipartimento di Scienze della Terra "A. Desio"

Università degli Studi di Milano



Programma e Riassunti

The role of Carbon from recycled carbonated metapelites in the transition from leucite-free to leucite–bearing ultrapotassic rocks: the Central Mediterranean case

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The Central Mediterranean region is one of the most important areas on Earth for studying subduction-related potassic and ultrapotassic magmatism derived from partial melting of metasomatized lithospheric mantle wedge. There, leucite-free (i.e., lamproite) and leucite-bearing (i.e., kamafugite, leucitite, and plagioleucitite) ultrapotassic rocks do closely occur with a time-related progression linked to the evolution of the mantle source and of the tectonic regime. Indeed, time- and space-related migration of magmatism followed the roll-back of the subducting slab and the anticlockwise drift of the Italian Peninsula. Leucite-free silica-rich lamproites are restricted to the early stage of magmatism, associated with ultrapotassic shoshonites and high-K calc-alkaline volcanic rocks. Present day ultrapotassic volcanism is restricted to the Neapolitan area. Central Mediterranean potassic and ultrapotassic rocks are extremely enriched in incompatible trace elements with variable f ractionation of Ta, Nb, and Ti (HFSE) with respect to Th and large ion lithophile elements (LILE). They are also variably enriched in radiogenic Sr and Pb and unradiogenic Nd. The main geochemical and isotopic signatures are consistent with sediment recycling within the mantle wedge via subduction. A twofold metasomatism, induced by recycling of pelitic sediments and dehydratation of lawsonite-bearing schists, is responsible for the early metasomatic events that enriched the mantle wedge of leucite-free ultrapotassic rocks (i.e., lamproite). Recycling of carbonate-rich pelites play an important role in the shift to silica-undersaturated ultrapotassic rocks (kalsilite- and leucite-bearing) of the classic "Roman province" controlling the genesis of leucite-bearing magmas (i.e., kamafugite and leucitite).