

## Behavior of organic matter originating from sedimentary rocks in Ryoke metamorphic rocks and granites in Yanai area, Japan

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This study examines the behavior of organic matter originally of sedimentary origin in Ryoke metamorphic rocks and granites of varying metamorphic grade. Carbonaceous matter (hydrocarbon and graphite or amorphous carbon) of a few 10 $\mu$ m in diameter with and without N,S and Cl were recognized in high grade pelitic metamorphic rocks, migmatite and granite by EPMA aerial compositional mapping. C, H, N and S elemental analyses, pyrolysis-gas chromatography (py-GC) and py-GC mass spectrometry were performed on bulk rock samples and biotites before and after HCl treatment. The results show (1)Carbonate carbon was not detected or was rare in all samples.(2)TOC (non-carbonate carbon)contents in pelitic paleosomes are greater than those of leucosomes, suggesting that TOC contents were higher in the residual part during melting.(3)TOC contents of biotite from granitic rocks were several times greater than those of their bulk rock host, but in migmatite the biotite TOC contents were similar to the bulk rock values.(4)Concentrations of hydrocarbons as pyrolysate (py-HC) do not differ among pelitic metamorphic rocks, migmatites and granite, although TOC is greater in the low grade metamorphic rocks than in migmatites and granites. The carbonaceous material could exist as graphite and/or amorphous carbon in both pelitic metamorphic rocks and migmatite.(5)py-GC-MS identified the hydrocarbons as aliphatic and aromatic species. These hydrocarbons were not free, but are bound to large carbonaceous units.

We conclude that (1)Most organic matter is released from the system during partial melting of pelitic rocks. However, a small amount is trapped in highly viscous felsic melt and polymerized during crystallization. (2)Carbonaceous material probably occupies some sites in biotite crystals, because extremely fine carbon is distributed throughout this mineral.