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Petrological characteristics of Carbonate-terrigenous sediments and its correlations with volcanic rocks in Tu Le area, Northwest Vietnam

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Volcanic rocks and carbonate-terrigenous sediments distribute extensively over Tu Le area of more than 5,000 km² in the northwest of Vietnam.

The research results suggest that the exposed carbonate-terrigenous sediments, in fact, are the remnants of the older sediments adjacent to, at domes of, or at upmost parts of the volcanic formations. There are not any clasts of volcanic sediments inside exposed areas of the sedimentary rocks. The volcanic clasts underlain by the sedimentary base are products of explosive eruptions. The sedimentary rocks contain fossils of Permian-Jurassic age, corresponding to Paleozoic-Mesozoic sedimentary formations that prevalently occur in the northwest region.

The volcanic rocks in Tu Le area, with the forming sequence determined by geological relationships, consist of 3 rock types: 1- basalt, 2- rhyolite, and 3- trachyte. They, along forming depth, are classified as sub-volcanic facies with a small amount of explosive eruption facies.

There are hot contacts and cutting relations between carbonate-terrigenous formations and Tu Le volcanic rocks. Contact metamorphic rocks consist mainly of quartzites, quartzite-like sandstones, spotted slates, marbles, tremolite marbles, classified as low grade of albite-epidote hornfels facies.

The ages of Tu Le volcanic formations have been subjected to many studies and reported to be in a range from 93 to 262 Ma, reflecting a long development of Tu Le igneous rocks.

The geological ages of volcanic and clast rocks in Tu Le area appear to be certainly later than those of surrounding rocks that contain fossils aged Permian-Jurassic Period.

Keywords: Petrology, carbonate-terrigenous sediments, volcanic rocks, Tu Le, Vietnam.