

## **Development of the selective acid extraction in carbon and oxygen isotope analysis of calcite and dolomite mixture**

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Carbon and oxygen isotope analysis is not only the basic means of research in carbonate formation environment and origin, but also the important marker of environmental evolution and diagenetic mechanism. Carbon and oxygen isotope analysis of different carbonates, such as calcite and dolomite, can provide more effective research evidence. Many researchers used selective acid extraction in carbon and oxygen isotope analysis of calcite and dolomite mixture. But there are some different opinion about the reaction condition in selective acid extraction. In our study, we did experiments of artificial mixtures and reaction rule experiments of pure mineral, in order to explore the principal factor of accuracy in carbon and oxygen isotope analysis of the mixture including calcite and dolomite, also in order to improve the reaction condition in selective acid extraction.

The reaction temperature and the reaction time would affect on the accuracy in carbon and oxygen isotope analysis of different carbonate minerals. The grain size would not affect on the analysis accuracy while the sieve mesh number was 200 or 300. Reaction rule experiments of pure mineral indicated that the reaction completeness was more than 99% when calcite reacted with phosphoric acid after 60min at 25°C, and the carbon and oxygen isotope of dolomite would get light firstly and remain stable later when dolomite reacted with phosphoric acid at 25°C. In the first stage of selective acid extraction reaction, when the reaction of sample and 100% phosphoric acid lasted 45min at 25°C, carbon dioxide from calcite should be collected. In the second stage, when the reaction lasted 240min at 25°C, carbon dioxide from both carbonates should be collected. In the third stage, when the reaction lasted 30min at 90°C, carbon dioxide from dolomite should be collected.

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