

## **Ultrahigh-pressure (UHP) low-Al titanites from carbonate-bearing rocks in Dabieshan-Sulu UHP terrane, eastern China**

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### **ABSTRACT**

Titanites previously reported from high-pressure rocks commonly contain high Al and F contents. This finding has led previous workers to conclude that high Al and F in titanite can expand its stability field to high-pressure and ultrahigh-pressure (UHP) conditions. In this study, a coesite inclusion was identified in titanite of aragonite- and jadeite-bearing gneiss from the Dabieshan UHP metamorphic terrane of eastern China. We also found UHP titanite in carbonate-bearing garnet clinopyroxenite from the Sulu UHP terrane. Interestingly, both types of the UHP titanite mentioned above contain low Al and F contents. Therefore, our data indicate that the high-Al and F contents are *not* necessary criteria for stabilizing titanite to UHP conditions. It is inferred that the UHP titanite formed via the reaction  $\text{TiO}_2 + \text{CaCO}_3 + \text{SiO}_2 = \text{CaTiSiO}_5 + \text{CO}_2$ , and that the presence of the UHP assemblage aragonite + rutile + clinopyroxene + coesite in the host rock and a very low  $X_{\text{CO}_2}$  value in the coexisting fluid are crucial conditions for the formation of these UHP titanites.