MODES OF OCCURRENCE AND SOLID SOLUTION CHEMISTRY OF TERRESTRIAL KOSMOCHLOR AND RELATED CHROMIUM-RICH MINERALS

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Kosmochlor ($NaCrSi_2O_6$) had been reported only three localities (Myanmar: Harlow and Olds, 1983, West Sayan in Russia: Dobretsov and Tatarinov, 1983 and Italy: Harlow and Olds, 1987) except for iron meteorites. Recently, we have newly described kosmochlor showing various solid solution chemistry from several lithologies and localities, i.e. jadeitites in the Omi area, Japan (Sakamoto and Takasu, 1997a), Polar Urals, Russia (Sakamoto and Takasu, 1997b) and Kazakhstan (Sakamoto and Takasu, 1998a), actinolite-tremolite rock in the Osayama area, Japan (Sakamoto and Takasu, 1996); nyboite-eckermannite rock in the Himekawa area, Japan (Sakamoto and Takasu, 1998b), and glaucophane rock in the Omi area, Japan. Most of the kosmochlors described so far show solid solution between jadeite ($NaAlSi_2O_6$) and kosmochlor or omphacite ($Di_{50}Jd_{50}$) and kosmochlor. Only the kosmochlor from the Osayama area in Japan shows solid solution relationship of kosmochlor and diopside ($CaMgSi_2O_6$) join. In the case of the Osayama area, bulk rock chemistry of the kosmochlor-bearing metamorphic rock is rich in CaO, and the associated amphiboles with kosmochlor are of tremolite and actinolite other than sodic amphiboles for the other cases. We will describe modes of occurrence and solid solution chemistry of kosmochlor, kosmochlor component-bearing clinopyroxenes and the related chromium-rich minerals, and discuss the crystallization process of these minerals from various lithologies and localities.