XXIV. Grove Mountain 99027

peridotite
9.97 grams

Introduction

Lin *et al.* (2002a, b) reported a new Martian meteorite from Grove Hill, Antarctica, collected by the Academy Sinica in 1999. It is shaped like a rounded cone and is covered with fusion crust.

Petrography

GRV99027 consists of mostly olivine and pyroxene and has both poikilitic and interstitial lithologies. A small amount of maskelynite, troilite and chromite can be found in the intersticies between the olivine and pyroxene. The texture and mineral composition appears similar to that of ALH77005 (Russell *et al.* 2002).

The modal composition is 55.1 vol. % pyroxene, 39.4% olivine, 4.4% plagioclase and 1.1% chromite.

Olivine and pyroxene exhibit undulose extinction, plagioclase has been partially shocked to maskelynite and several grains of olivine show granulation. However, no shock-melted veins were found in thin section.

The shock stage is S4, weathering grade W1 (Russell *et al*. 2002).

Mineral Chemistry

Olivine: The average composition of olivine is Fo_{73}.

Pyroxene: The composition of pyroxene is $En_{74}Fs_{22}Wo_4$. Orthopyroxene $En_{78}Wo_2$ has FeO/MnO ratio = 34 ± 5.

Plagioclase: Plagioclase (An_{53}) has been partially converted to glass by shock.

Opaque Oxides: Euhedral chromite is mainly enclosed in pyroxene.

Phosphates: Whitlockite grains up to 150 microns are found interstitial to olivine, pyroxene and plagioclase (Guan *et al.* 2003). They include small apatite grains and some veins of plagioclase glass.

Whole-rock Composition

None reported.

Isotopes

The deuterium/hydrogen ratio (D/H) of phosphates in GRV99027 has been found to be high and variable by Guan *et al.* (2003).