

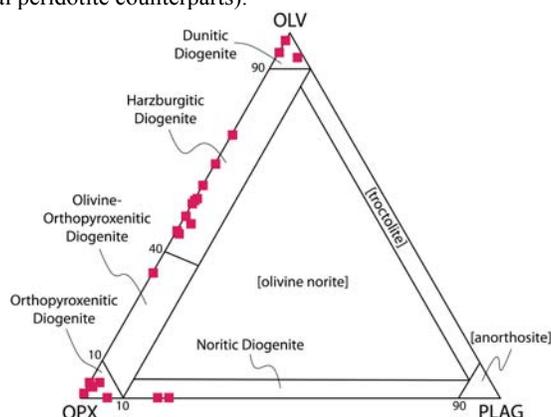
### A NOMENCLATURE SYSTEM FOR DIOGENITES CONSISTENT WITH THE IUGS SYSTEM FOR NAMING TERRESTRIAL ULTRAMAFIC ROCKS.

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**Background:** Traditionally diogenites have been considered to be extraterrestrial ultramafic rocks dominated by orthopyroxene and having igneous (presumed to be cumulate) textures. Many diogenites have been shocked, and exhibit cataclastic (crushed) textures, although few are true breccias (requiring rotation of clasts). With the discovery of many more specimens in both hot and cold deserts, the range of orthopyroxene compositions found in diogenites has expanded considerably [e.g., 1], and now spans a range from  $Fs_{13}$  to  $Fs_{34}$ . Furthermore the modal mineralogy of diogenitic rocks now includes not only chromite (and minor Ni-poor metal) but variable amounts of olivine and calcic plagioclase (yet very little clinopyroxene).

Recently it has been suggested [2] that the name diogenite be expanded to include rocks containing >40 volume% olivine (previously termed olivine diogenites by us [3]), and even to related rocks composed of more than 90 volume% olivine (of which there are at least five known examples [4]).

**A Logical Nomenclature System:** The new terms *harzburgitic diogenite* and *dunitic diogenite* are very reasonable descriptors for those examples with 40-90 volume% olivine and  $\geq 90$  volume% olivine, respectively. However, in keeping with the established IUGS nomenclature for terrestrial ultramafic rocks [5], we suggest that the additional terms *olivine-orthopyroxenitic diogenite* and *noritic diogenite* be used to describe the few specimens with 10-40 volume% olivine and with >10 volume% plagioclase, respectively. The diagram below is modified from Figure 2.6 of [5], and on it are plotted the modes for 21 Northwest African and Arabian Peninsula diogenitic specimens that we have studied in detail. Note that diogenites can contain up to 10 volume% plagioclase before becoming noritic, and such examples could be termed plagioclase-bearing diogenites (like their terrestrial peridotite counterparts).



**References:** [1] Bunch T. et al. (2007) *70<sup>th</sup> Meteorit. Soc. Mtg.*, #5133 [2] Beck A. and McSween H. (2010) *MAPS* **45**, 850-872 [3] Irving A. et al. (2005) *Lunar Planet. Sci.* **XXXVI**, #2188 [4] Bunch T. et al. (2010) *73<sup>rd</sup> Meteorit. Soc. Mtg.*, #5315 [5] LeMaitre et al. (2002) *Igneous Rocks: A Classification and Glossary of Terms*, 2nd Edition. Cambridge University Press.