FIRST EVIDENCE OF HIGH PRESSURE SILICA: STISHOVITE AND SEIFERTITE IN LUNAR METEORITE NORTHWEST AFRICA 4734.

H. Chennaoui Aoudjehane[1-2], A. Jambon[2] [1]Université Hassan II Aïn Chock, Laboratoire Géosciences, BP 5366 Maârif Casablanca Morocco (e-mail: h.chennaoui@fsac.ac.ma), [2]Université Pierre et Marie Curie-Paris6 and IPGP Laboratoire MAGIE, Case 110, 4 place Jussieu, 75252 Paris France.

Introduction: Silica is a rare phase in lunar rocks; it has been described as either quartz, cristobalite and/or tridymite [1]. Northwest Africa 4734, is an uncommon type of lunar rock, which may be launched paired with the LaPaz Icefield Lunar Mare basalts found in 2002-03 in Antarctica [2-6], it is a coarse grained rock of basaltic composition, exhibits a number of significant shock features, such as PDFs, extensive fracturation of pyroxene, impact melt pockets and transformation of plagioclase to maskelynite; silica is present as a minor phase.

Analytical procedures: We studied the speciation of silica polymorphs to characterize the shock, using SEM imaging, Raman spectroscopy, CL imaging and spectroscopy. Further details can be found in [7].

Results: According to the CL spectra [7-9], cristobalite, tridymite, high-pressure silica glass, stishovite and seifertite, are all present. Special emphasis is made on stishovite and seifertite, which, like in shergottites, exhibit specific textural features [7]. Cathodoluminescence spectra characteristic of high-pressure silica phases: glass, stishovite and seifertite have been recorded in addition to the original low-pressure phases. The remanence of cristobalite and tridymite underscores a significant heterogeneity of the shock supported by the rock. This is the first report of high-pressure silica phases, stishovite and seifertite, in a lunar meteorite. When compared to shergottites, plagioclase appears to be significantly less transformed to maskelynite. This probably results from the low sodium content of plagioclase, which inhibits the transformation, and not from the shock intensity.

The presence of high and low pressure silica phases, transformed from either cristobalite or tridymite, as well as plagioclase and maskelynite, indicate strong heterogeneity of shock with a peak shock intensity of about 45 GPa [10, 11, 12]

References: [1] Korotev R. L. 2005. *Chemie der Erde Geochemistry* 65 :297-346. [2] Day et al. 2006 *Geochimica et Cosmochimica Acta* 70 :1581-1600. [3] Zeigler et al. 2005. *Meteoritics and Planetary Science* 40-N 7:1073-1101. [4] Joy et al. 2006 *Meteoritics and Planetary Science* 41-Nr 7:103-1025. [5] Anand et al. 2006. *Geochimica et Cosmochimica Acta* 70:246-264. [6] Jambon et al. 2008 submitted. [7] Chennaoui Aoudjehane H. et al. 2005. *Meteoritics and Planetary Science* 40:967-979. [8] Chennaoui Aoudjehane H. et al. 2006. Abstract #1036. 37th Lunar and Planetary Science Conference. [9] Chennaoui Aoudjehane H. et al. 2006. abstract 1037 37th LPSC. [10] El Goresy A. et al. 2004. *Journal of Physics and Chemistry of Solids.* **65**, 1597-1608. [11] Luo et al, 2003 *Journal of Geophysical. Research* 108, B9, 2421-2433. [12] Stoëffler D. et al 1986. *Geochim. Cosmochim. Acta* 50:889-913.