RAMAN SPECTROSCOPY INVESTGATIONS OF TAGISH LAKE NANODIAMONDS.

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Introduction: Tagish Lake, a carbonaceous chondrite C2, fell on 18th January 2000 in Canada. According to [1], the meteorite contains about 3650–4330 (ppm) of nanodiamonds, while inferred from measurements of xenon [2] the abundance is 1800-2500 ppm. This is the highest nanodiamond abundance reported from chondrites. Raman spectroscopic signatures of separated nanodiamonds have been studied in the work presented here.

Samples and Experiments: Nanodiamonds were separated following established procedures [3] Raman spectra have been recorded using the confocal Raman micro-spectrometer T-64000 (Jobin-Yvon) with Argon line λ=514.5 nm.

Results: The spectra show a diamond peak at 1329 cm^{-1} (FWHM of about 50 cm^{-1}) and a broad peak around 1600 cm^{-1} (Fig.1) [4]. Previous investigations of Allende meteorite presolar nanodiamonds showed peaks at 1326 cm^{-1} and 1590 cm^{-1} [5] what is in agreement of laboratory manufactured nanodiamonds Raman investigations [6].

Shifts of diamond peak positions (monocrystalline cubic diamond has Raman peak at 1332 cm^{-1}) occur because of the nanometer crystal sizes [6] or because of different polytypes [7] of diamond occuring in the sample.

References: [1] Grady M. M. et al. (2002) *Meteoritics & Planetary Science* 37:713-735. [2] Jakubowski T. et al. (2011) *Goldschmidt 2011*, Abstract #2944. [3] Amari S. et al. (1994) *Geochimica et Cosmochimica Acta* 58:459-470. [4] Jakubowski T. (2011) PhD thesis, Technical University of Lodz. [5] Gucsik A. et al. (2008) *Proceedings of the IAU Symposium 251 "Organic Matter in Space"*:335-339. [6] Osswald S. et al. (2009) *Physical Review B* 80:075419. [7] Phelps A.W. (1999) *Lunar and Planetary Science*, #1749.

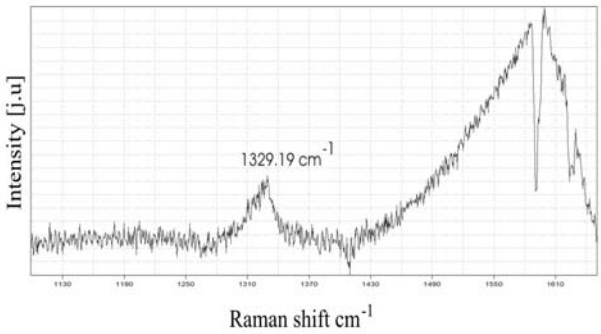

Fig.1 Raman spectra of nanodiamonds from Tagish Lake carbonaceous chondrite. The diamond peak is detected at the position 1329 cm^{-1}.