**CATHODOLUMINESCENCE STUDY OF ALBITIC FELDSPARS AND CA-PHOSPHATES IN TYPE 4-6 ORDINARY CHONDRITES.** F. Brandstätter. Naturhistorisches Museum, Postfach 417, A-1014 Vienna, Austria. E-mail: franz.brandstaetter@nhm-wien.ac.at.

**Introduction:** Many mineral phases which occur in meteorites show cathodoluminescence (CL) [1]. CL properties have been investigated in different ways ranging from bulk CL spectroscopy (CLS) of cm-sized areas to CLS of μm-sized single mineral phases. Recent examples are the use of CL color indices as a parameter for petrologic changes in meteorites [2] and CLS of experimentally shock-metamorphosed quartzite [3]. Here, I report on the preliminary results of CLS of albitic feldspars (60 grains), chlorapatite (11 grains), and whitlockite (8 grains) from 15 type 4-6 ordinary chondrites (including H, L and LL).

**Experimental:** CL spectra were acquired with an Oxford MonoCL2 system attached to a JEOL JSM 6400 SEM operated at 15 kV accelerating voltage and 2.2 nA beam current. All spectra were recorded in the range of 200-800 nm with 2 nm wavelength steps. Scanned areas of feldspars and phosphates were about 100 $\mu m^2$ and 400 $\mu m^2$, respectively. The selected areas were also analyzed by analytical SEM for major element compositions and to check for possible interference with adjacent mineral phases.

**Results and discussion:** *Feldspars* are albitic plagioclases with end member compositions within the range $An_{10-12}Ab_{82-86}Or_{4-6}$ as compiled for equilibrated OCs [4]. All recorded CL spectra are dominated by one broad peak in the blue region centered around 430-440 nm. This peak has an asymmetric shape with a FWHM in the range of 110-140 nm. The blue emission occurring in almost all feldspars has been related to structural defects [5]. Blue CL with one broad peak centered around 430 nm has also been reported for terrestrial alkali feldspars [6]. However, no correlation between between CL properties of feldspar grains and their host meteorite (type or chondrite group) could be observed in this study.

*Chlorapatites* typically show little variation in their major element composition [4] containing 5.0-5.5 wt% chlorine. CL spectra exhibit two broad emission peaks centered around 374 nm and 580 nm. In most cases the relative intensity ratios of these two peaks are different for different grains. These observed variation in CL intensity of chlorapatite could be related to the crystal orientation dependence of CL in apatite crystals [7]. However, the overall shape of the spectra is most likely controlled by the presence of component CL bands of REE activators [8].

*Whitlockites* typically contain significant amounts of $Na_2O$ (2.4-3.1 wt%) and MgO (3.8-4.4 wt%). CL spectra exhibit distinct peaks centered around 348 and 365 (double peak), 481, 572 and 647 nm. In contrast to the chlorapatites, the overall shape of the CL spectra of all whitlockites investigated so far is roughly the same. Therefore, CLS could be used to identify whitlockite in meteorites.

**References:** [1] Steele I. A. 1989. 20th Lunar & Planetary Science Conference. pp. 1052-1053. [2] Meier A. et al. 2003. Abstract #1037. 34th Lunar & Planetary Science Conference. [3] Gucsik A. et al. 2003. *Meteoritics & Planetary Science* 38: 1187-1197. [4] Brearley A. J. and Jones R. H. 1998. In: *Planetary Materials* (ed. Papike J. J.) . Rev. Mineral. 36. Mineral. Soc. America:3/1-398. [5] Götze J. et al. 2000. In: *Cathodoluminescence in Geosciences* (eds. Pagel M. et al.). Springer N. Y.: 245-270. [6] Finch A. A. and Klein J. 1999. *Contributions to Mineralogy and Petrology* 135: 234-243. [7] Barbarand J. and Pagel M. 2001. *American Mineralogist* 86: 473-484. [8] Blanc P. et al. 2000. In: *Cathodoluminescence in Geosciences* (eds. Pagel M. et al.). Springer N. Y.: 127-160.