QUANTITATIVE SUB MICRON SYNCHROTRON XRF ANALYSES OF REE PATTERN. A FUTURE PERSPECTIVE F.E. Brenker[1], S. Schmitz[1], B. Vekemans[2], B. de Samber[2], T. Schoonjans[2] and L. Vincze[2], [1]Geoscience Institute / Mineralogy, Goethe University Frankfurt, Altenhoeferallee 1, 60438 Frankfurt am Main, Germany, f.brenker@em.uni-frankfurt.de, [2]Department of Analytical Chemistry, Ghent University, Krijgslaan 281 S12, B-9000 Ghent, Belgium.

Introduction: REE pattern of CAI are recognized as useful indicators to decipher and distinguish processes in solar nebula and at the respective parent body [e.g. 1-3]. These include primary condensation, reaction of the early condensates with the solar gas, thermal reprocessing as well as melting. However non destructive measurement techniques with high spatial resolution (sub micron) are rare.

Synchrotron XRF at Beamline P06 at PETRA III: The new microbeam set-up at the PETRA-III P06 Hard X-ray Micro/Nanoprobe will enable submicron confocal-XRF experiments. Next to the conventional confocal-XRF set-up based on energy-dispersive (ED) detectors, the experiment will also test the usability of wavelength-dispersive (WD) detection for REE. Up-to-now, confocal XRF experiments were exclusively based on the use of ED-detectors coupled with polycapillary optics. The disadvantage of this combination is that it does not allow the detection of REE by their K-lines in geological samples due to the strong cut-off in polycapillary efficiency above ~20 keV. At the same time, the detection of REE based on L-lines is hampered by the poor energy resolution of available ED detectors. This limited energy resolution results in severe interferences between the K-series XRF lines of transition elements and the L-lines of REE, making the detection of REE by L-lines in the presence of transition metals impossible.

Future perspectives: In our new approach the coupling of polycapillary based confocal optics with a WD-detector will overcome the above described shortcoming with respect to the detection of REE. Furthermore it is expected that with the new set-up a spatial resolution well below 1 μm is feasible.

In addition the just recently introduced new preparation technique ArIS [4] for huge (> 50,000 μm^2) electron transparent thin films will enable the detailed combined SIMS, Synchrotron and TEM analyses.

References: [1]°El Goresy A. et al. (2002) *GCA, 66,* 1459–1491. [2]°Lundstrom C.C. et al. (2006) *GCA, 70,* 3421–3435. [3]°Davis A. M. et al. (1996) *LPS XXVII*, 291-292. [4]°Stojic A. & Brenker F.E. (2010) *EJM, 22*, 17-21