LABILE TRACE ELEMENTS IN ANGRITES, M.-S. Wang and M. E. Lipschutz, Dept. of Chemistry, Purdue Univ., W. Lafayette, IN 47907

The three known angrites - Augra dos Reis or ADOR (1.5 kg), LEW 86010 (6.9 g) and LEW 87051 (0.6 g) - constitute a group of achondrites that currently vie with the eucrites and associated meteorites for the honor of having been formed from the most primitive nucleosynthetic material in the Solar System. Their radiogenic ages are among the very oldest determined on Solar System materials by a variety of different techniques (BV Study Project, 1981).

Volatile/mobile (labile) trace elements and other key elements are known to give important genetic information for meteorites, including achondrites such as eucrites (Paul and Lipschutz, 1989) and lunar meteorites (Wang and Lipschutz, 1990). There exist few prior data for Ag, Au, Bi, Cd, Co, Cs, Ga, In, Rb, Sb, Se, Te, Tl, U and Zn even in ADOR. To remedy this lack of data, we have analyzed the first two angrites listed and are currently working on LEW 87051. All samples studied were previously analyzed by INAA at NASA-JSC.

By the time of LPSC XXI, we expect to have complete data for all samples: at present, results are available only for ADOR and LEW 87051. The data show some peculiar trends. The 2 angrites have similar ($\leq$ two-fold variation) contents of 6 elements (Bi, Co and lithophile Cs, Ga, Rb and U). Contents of the other 9 elements differ by factors of 2-23 with LEW 86010 containing lower concentrations for all elements but Tl - the most variable element. Cl-normalized concentrations scatter from 0.0014-0.19 with no systematic pattern. Hence, there is neither evidence for admixed micrometeorite component on the angrite parent body surface nor is there evidence for a specific geochemical or thermal fractionation process.

The data do demonstrate that terrestrial processes have not affected either angrite. ADOR fell in water, yet its Sr isotopic composition is very primitive. The generally lower contents of labile elements in LEW 86010 might be ascribable to leaching loss in Antarctica except that the elements most sensitive to this - Cs and Rb - have identical contents in the Antarctic and non-Antarctic samples. We believe that the data for these 2 angrites suggest that both formed by igneous fractionation, with LEW 86010 having formed from a more refractory-rich melt than ADOR. We will soon know what additional information is contained within LEW 87051.

Acknowledgements. This research was supported by NASA grant NAG 9-48 and NSF grant DPP-87145853.

References

BV Study Report (1981) Basaltic Volcanism on the Terrestrial Planets, Pergamon Press.

R. L. Paul and M. E. Lipschutz (1989) Chemical studies of differentiated meteorites - I. Labile trace elements in Antarctic and non-Antarctic eucrites. Geochim. Cosmochim. Acta, submitted.

M.-S. Wang and M. E. Lipschutz (1990) Labile trace elements in lunar meteorite MAC 88105 (abstr.). Lunar Planet Sci. Conf. XXI, submitted.