OCCURRENCE OF NOBLE METAL PHASES IN FRAGMENTS OF DIFFERENT PETROLOGIC TYPE IN THE RUMURUTI CHONDRITE. J. Berlin, C. M. Lingemann and D. Stöffler, Institut für Mineralogie, Museum für Naturkunde, Invalidenstraße 43, 10115 Berlin, Germany (jana.berlin@rz.hu-berlin.de).

Introduction: Meteorites belonging to the R-chondrite group are characterized by a high degree of oxidation, scarcity of FeNi-metal and high $\Delta^{17}O$ values [1-3]. Noble metal phases were found in R-chondrites of different petrologic types [2-5]. A correlation between the occurrence of different noble metal phases and the petrologic type of their host meteorite was indicated [5]. Rumuruti is a genomict breccia containing lithic fragments of petrologic type 3 to 6 and it is the only fall of the group. Two fragments (type 3 and 6 respectively) were studied in detail to confirm the correlation mentioned above. Using a scanning electron microscope the fragments were systematically scanned in backscattered mode with a magnification of 500x.

Observations: Type 3 material is the most primordial material in R chondrites [6,7]. In Rumuruti it occurs as dark lithic fragments containing unequilibrated large olivine and Ca-poor pyroxene crystals of variable Fe-content (Fa 7-44 mol%, Fs 4-24 mol%). They are embedded in a porous matrix of predominantly tiny olivine crystals which have a relatively high Fa-content (Fa 46-49 mol%). Chondrules and chondrule-like objects are common as well as nearly rounded, large intergrowths of pentlandite, pyrrhotite and magnetite. In the examined type 3 fragment (~25 mm²) twelve noble metal phases were detected, mostly platinum with Fe and Ir and some osmium grains. They occur at the edges or in fractures of Fe-(Ni)-sulfides. Their size ranges between 0.5 and 6 µm. One osmium phase with a high content of iridium and ruthenium was found in a zoned olivine crystal. Furthermore Ni_3Ge was found surrounded by Fe-(Ni)-sulfides – three grains in chondrule-like objects and one in a large olivine crystal.

In the light type 6 fragment (~23 mm²), which contains homogeneous olivine (Fa 39 mol%) and poorly defined chondrules in a recrystallized matrix, only 6 noble metal phases were found. Sperrylite ($PtAs_2$) is the most common phase, followed by a Pt-Te-As-phase. They occur at the edges of small grains of pentlandite and chalcopyrite and are all below 1 µm in diameter.

Discussion: In Rumuruti the occurrence of fresh noble metal grains like platinum, osmium and metallic alloys is restricted to type 3 material. In type 6 only arsenides and tellurides of platinum are found. These observations confirm the assumed variation of noble metal phases with metamorphic grade of the host material. Ge-rich phases exist only in the type 3 fragment.

The noble metals, alloys and Ge-rich phases in type 3 material obviously represent direct condensates from the solar nebula. Similar phases are common in CAIs of different CV chondrites [8-12]. During thermometamorphism on the parent body the existing noble metal phases were transformed into arsenides and tellurides. This interpretation is compatible with the presence of such phases in thermometamorphic CK chondrites (types 4-6) [13]. The Ge-rich phases were decomposed due to the volatility of germanium and are therefore lacking in type 6 material of Rumuruti and in CK chondrites.

References: [1] Rubin A. E. and Kallemeyn G. W. (1994) *Meteoritics 29*, 255-264. [2] Bischoff A. et al. (1994) *Meteoritics 29*, 264-274. [3] Schulze H. et al. (1994) *Meteoritics 29*, 275-286. [4] Schulze H. (1998) *Meteoritics & Planet. Sci. 33*, A131-132. [5] Schulze H. (1999) *LPSC XXX*, #1720. [6] Lingemann C. M. et al. (2000) *Meteoritics & Planet. Sci. 35*, A98. [7] Bischoff A. (2000) *Meteoritics & Planet. Sci. 35*, 699-706. [8] Bischoff A. and Palme H. (1987) *GCA 51*, 2733-2748. [9] El Goresy et al. (1978) *Proc. LPSC IX,* 1279-1303. [10] Armstrong J. T. et al. (1985) *Meteoritics 20*, 603-604. [11] Armstrong J.T. (1992) *LPSC XXIII*, 37-38. [12] Demidova S. I. and Ulyanov A. A. (2001) *LPSC XXXII*, #1295 [13] Geiger T. and Bischoff A. (1995) *Planet. Space Sci. 43*, 485-498.