A STUDY ON SUBOPHITIC AND "UNIQUE" STRANGERS IN KREEP-RICH POIKILITIC APOLLO 16 IMPACT MELT ROCKS. Reimold, W.U., Borchardt, R., and Möllers, F., Institute for Mineralogy, Univ. Münster, D-4400 Münster, FRG.

The matrices of Apollo 16 impact melt rocks 65015, 62235, and 65777 display some common characteristics: all three samples have poikilitic texture, rather similar mineralogy, and belong to the poikilitic rocks of highest KREEP-content [1]. Despite this they are not cogenetic, as the ages of 65777 (3.72±0.02 AE) and 65015 (3.82±0.05 AE) differ considerably. In all three samples areas of subophitic texture can be observed, which is an unique phenomenon among the suite of Apollo 16 poikilitic melt rocks (the occurrence of poikilitic patches in subophitic rocks has been described more often [2] and has also been observed and explained in dynamic crystallization experiments[3]). An electron microprobe study of some subophitic areas within thin sections 65015, 62235, 66, and 65777, was undertaken in order to answer the question whether matrix and "strangers" share a common genesis or form clocf-matrix relationships. Two unique clasts - a chondrule-like (Fig. 1) and a granulitic (Figs. 4, 5) were discovered and analyzed, too. DBA analyses of matrix and "strange objects" were recalculated into CIPW normative compositions, and the main normative mineral abundances are presented in Fig. 10. Mineral chemistry is presented in Fig. 11.

65777, 11: Fig. 1 shows the nearly round, chondrule-like, plagioclase-pyroxene-olivine aggregate. One half of it is surrounded by an olivine rim and an olivine clast served as nucleus for the sphenoid crystallization. Plagioclase composition (Fig. 11) ranges from An[72, 5] to An[72, 6]. pyroxene composition is comparable to that of matrix pyroxene (4), and olivine contains 71 mole% Fe. Composition of Fe-Ni metal (Fe 93, 14, 19, Co 472, 71, Ni 6, 285, 26 wt%) is similar to that of matrix metal (5). The chemical bulk composition is similar to matrix or bulk rock chemistry (Fig. 10). Thus there is no evidence for a foreign origin of the "chondrule", as the An content of "chondrule" plagioclase lower than that of matrix plagioclase can be explained if assuming that the high An analyses (4) of matrix feldspar contain a number of plagioclase clasts data measured in relics of anorthositic target rock. Two of the numerous subophitic areas in 65777, 11 (SI - Fig. 2; SII - Fig. 3) were also analyzed by DBA and show high TiO[2], K[2]O, and P[2]O[5] contents otherwise only characteristic of poikilitic KREEP-rich melts. The CIPW mineral abundances for I or close to that of the bulk composition (Fig. 10), but I is more Fe- and Mg-rich than the matrix. Plagioclase in I ranges from An[72, 8] to An[72, 6]. Olivine - minor constituent - has Fo[74, 97] and orthoclose (An[12, 95]Ab[12, 09]) is observed, too. Due to the evidence presented here and the texturally distinct boundaries of many such patches, area I can be clearly identified as clast and as a fragment of an unique KREEP-rich subophitic melt complex. Its CIPW normative composition can only be compared to that of 64485 (1), but the KREEP (and Fe, Mg) content of 65777 is still higher. Subophitic area II - more olivine-rich than I - seems to be another fragment of the SI forming melt. Texturally both clasts are identical.

62235, 66: Subophitic area I is an ophitic-subophitic aggregtate of lathy to bulky plagioclase (An[22, 56]), roundish olivine (Fo[62, 66]) and anhedral pyroxene filling interstices between plagioclase crystals (Fig. 6). Mineral chemistry, bulk analysis, and clear-cut margins to poikilitic matrix leave no doubt that area I is xenolithic. Area II counts for the same conclusion. It is an anorthositic aggregate of plagioclase laths with interstitial areas filled by pyroxene and >20vol% of opaque and mesostasis. Its bulk and mineralogical composition is similar to the highly feldspathic melts of 64145 or 65795 type, from which it only differs in its most evident clast content (Fig. 7) and fine grain size. The most interesting feature of section 62235, 66 is a 2x1 cm large granulitic clast (Figs. 4, 5), an accumulate of totally recrystallized prismatic to anhedral plagioclase (An[91, 94]) and prismatic to roundish olivine (Fo[65, 4-67, 0]). The texture is similar to Apollo 17 granuloblastic rocks or granulitic rike sample 67746. Contrary, the bulk chemistry (Fig. 10) is totally distinct from any previously analyzed granulitic rock. This does not hold for the mineral chemistry (Fig. 11), which suggests a crystallization and cooling history similar to those of other granulites. Fig. 10 shows how for the compositional range of granulitic rocks can be extended now. This fact, and the age dating results of (6) - coarse fine granulitic fragments of 3.9 - 4.0 AE ages - and (7) - a 3.85 AE age for 67746 - could mean, that various phases of thermal metamorphism are recorded during which heterogeneous parts of the lunar crust were metamorphosed.

65015, 88: Matrix and one subophitic area (Figs. 8, 9) were analyzed in this thin section. The latter is an extremely fine-grained (20-35µm) aggregate of -60 vol% plagioclase laths (An[25, 52]), pyroxene (En[65, 2]Fs[34, 5]Wo[9, 5]) and olivine (Fo[60, 5]) at about 20vol% each. Accessory phases are ilmenite, Fe-Ni metal, and probably apatite. Both olivine and pyroxene are slightly enriched in FeO compared to the matrix minerals, and the bulk chemistry, too, does not leave any doubt about the xenolithic nature of this area.

By now we cannot rule out that some of these subophitic clasts might represent fragments of the target.
rocks from which the poikilitic impact melt were formed, but additional analyses of metal phases in the clasts might solve this problem.