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The contrast in mineralogy, texture and hibonite composition between the VSAD and H-S regions suggests that these regions may have existed as independent objects that evolved in distinct nebular localities. Between these two regions is a distinct, 100-200 μm wide band of spinel which is embayed by fine-grained anorthite and diopside. It is very similar to the mantle, suggesting that the two different types of nebular material present in this inclusion were cemented together by deposition of the mantle. Occasionally, inclusions with different nebular histories coexisted in the same nebular locale while the gas was still hot enough for condensation of mantles.

BACHMUT (L6) CHONDRULE J 2689: METAMORPHISM VERSUS METASOMATISM

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Chondrule J 2689 is a large (8 mm) RP chondrule found by F. Berwerth in 1911 in one of our major Bachmut (L6) specimens (A 915). It has a very fine-grained hornfelsic texture and consists of orthopyroxene, olivine, clinopyroxene, plagioclase, chromite, troilite, and metal. The silicate minerals are "equilibrated" and very similar in composition to those of the host meteorite. Metals and troilite are finely dispersed throughout the chondrule but at very low abundances. The metal forms small anhedral grains and is dominantly taenite with a peculiar composition (average of 20 grains: Ni = 13.7 ± 1.6, Co = 0.82 ± 0.09 weight %) very different from metal of the host (Fig. 1). One 20 μm metal grain consists of a kamacite lamella in high Ni taenite. Host chondrite metal is monotonous except for one kamacite grain with very low Co content (Fig. 1). The bulk composition of the chondrule as determined by INAA and broad beam electron microprobe analysis is fractionated with respect to CI composition (Table 1). The refractory lithophile elements Sc, Al, Ca, and Sm and the moderately volatile elements Mn, Na, and K are enriched up to 3 × CI. Chromium is depleted. All siderophile elements are depleted in the sequence Ir (0.1 × CI)-Ni, Co-Au (0.27 × CI). Oxygen isotopic compositions of the chondrule and the adjacent host are not equilibrated (R.N. Clayton, pers. comm., 1985).

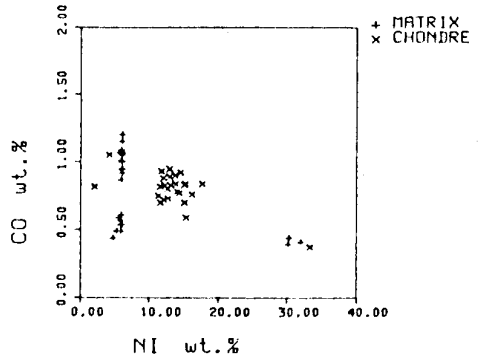

Fig. 1 Metal composition in Bachmut chondrule and bulk.

Table 1
Bulk composition of chondrule J 2689 (INAA, EMP)

Element	Content	CI norm.
Na (mg/g)	8.76	1.75
Mg (mg/g)	154	1.76
Al (mg/g)	14.3	1.75
Si (mg/g)	245	2.29
K (mg/g)	1.49	2.88
Ca (mg/g)	18.4	2.04
Sc (ppm)	16.6	2.81
Ti (ppm)	840	1.91
Cr (mg/g)	2.43	0.91
Mn (mg/g)	3.05	1.68
Fe (mg/g)	118	0.613
Co (ppm)	68	0.136
Ni (mg/g)	1.60	0.149
Sm (ppm)	0.22	1.43
Ir (ppb)	48	0.101
Au (ppb)	38	0.268

Conclusion: Chondrule J 2689 preserved primary bulk compositional features and metal compositions in spite of being entrapped in a L6 chondrite. Its bulk composition could be interpreted as a liquid condensate from a fractionated vapor. The low degree of recrystallization, the non-existent communication between chondrule metal and chondrule oxygen with the bulk make it improbable that the chondrule experienced a metamorphic event inside the Bachmut parent body. Apparently, the "equilibration" features (Fe/Mg, recrystallization) were established before incorporation into the Bachmut rock.

ISOLATED OLIVINES IN Y82042 (C2): FRACTIONAL CONDENSATION?

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Olivine is present in the Y82042 carbonaceous chondrite (Grady *et al.*, 1987) as isolated grains or associated with phyllosilicates in accretionary fragments and BO chondrule-like objects. The isolated olivines range in size from about 15 to 250 μm longest dimension. Shapes are mostly anhedral to highly irregular. All olivines are enveloped by rims of phyllosilicate. The compositions of isolated olivines are overwhelmingly more magnesian than Fa 1.5 with very few exceptions up to Fa 25.7. Minor element contents are generally high and within the range previously reported (e.g. Hoinkes and Kurat, 1975; Steele, 1986; Steele and Smith, 1986). Two compositional populations can be distinguished in Figure 1: the common Ca-rich one with good inter-elemental correlations and a rare Ca-poor one (CaO < 0.2%). The latter is particularly abundant in one large grain (Yam D) which also exhibits another peculiarity: