THE ALKHAMĀSIN, SAUDI ARABIA, IRON METEORITE

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The Alkhamāsin, Saudi Arabia, iron meteorite is a 1200 kg in weight. It was first discovered as a meteorite in 1973 by the Saudi Educational Institute Staff of Wadi Al Dawasir about 25 km NE Alkhamāsin, Wadi Al Dawasir 20°36′ N, 44°53′ E. The meteorite is now on exhibit at King Saud University.

Remnant of deep weathering appears as if large amounts of mass may have been lost. Oxide seems to form a scale that flakes off of the specimen leaving a thin coating of oxide over relatively unaltered metal. A specimen of only about 30 g has been made available for preliminary examination. Its chemical composition in wt. % is 6.15 Ni, 0.52 Co, and 0.30 P, and in ppm is 56 Ga, 160 Ge, and 0.07 Ir.

The dominant metallographic feature of the available section is a pair of large schreibersites in the cm size range surrounded by swathing kamacite. The schreibersite is badly crushed and contains several small troilites. Small rhabdites to microrhabdites pervade the kamacite, and an occasional very thin lamellar schreibersite is present. Rhabdites generally have diffuse borders with kamacite, and in some areas severe melting of rhabdite edges has taken place. Secondary recrystallization of kamacite due to heating is present throughout. Whether this is preterrestrial or man induced heating is not clear at this point.

The chemical data and the limited metallographic examination that has been possible on the material available suggest that the meteorite belongs to chemical group IIB. No evidence of a coarsest octahedrite structure was observed, probably due to an unrepresentative sample.

THE ALLAN HILLS METEORITE ICEFIELD — AN ALTERNATE VIEW

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More than 1300 meteorites have been found on the surface of blue icefields in North Victorialand, Antarctica. The Allan Hills Icefield (about 100 km^2) has exceptionally high meteorite concentrations while other icefields to the West have much smaller concentrations.

Measurements of the rates of ablation and of horizontal displacement of the ice surface near the Allan Hills have been conducted since 1978 at a 20 station triangulation network. These data show that the horizontal ice velocity at the most active stations is about one m/yr and less at the high meteorite concentration site. Ablation of the ice surface averages about 4.2 cm/yr. Measurements of the oxygen isotopic composition of surface ice along the triangulation network show a rather large scatter of about 8 $\delta^{18}O$‰. This indicates that the ice comes from different areas or possibly is different in age. The terrestrial ages of Allan Hills meteorites are between 0 and 700,000 years, with only a few older than 400,000 years.

A model for the appearance of meteorites on blue ice surfaces in Antarctica is that specimens are carried within the moving ice sheet to stagnant areas where they are uncovered by the ablation process (see e.g. Bull and Lipschutz, 1982). These areas ("emergent zones") are fed by ice that originally accumulated as snow at the source regions of the ice. This model accounts for the general occurrence of meteorites on blue ice fields but an additional mechanism is needed to explain the high concentrations found at the Allan Hills.

It is suggested that this icefield has concentrated meteorites primarily by horizontal movement of the ice from the emergent zones located to the west of the concentration zone. These meteorites are transported by surface compressive flow of the ice into the Allan Hills Meteorite Icefield and left stranded in an area where ice is only lost by the ablation process. This model seems to be in agreement with all field and laboratory observations.

Bull, C. and M. Lipschutz, 1982. Workshop on Antarctic Glaciology and Meteorites. LPI Tech. Rpt. 82-03.