

Fe-Ni separation texture by Niho meteorite shower

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1. Introduction:

Fe and Ni cannot be mixed quickly due to its slow diffusion. This suggests that Fe and Ni are separated theoretically after shock wave explosion. But there is no real example to be separated by natural shock wave explosion. Recently author found that there are spherules by shock wave reaction after Nio meteorite shower explosion. Natural tweedy lamellar textures are found also from Nio spherules, which will be new fact to make quasi-Widmannstaetten texture of iron meteorites from quick shock wave explosions with other types of chemical composition. The present results will make positive fact for Ni-S formation of the Sudbury Basin of Canada where there is few Fe inside the basin. The main purpose of the present study is to report Fe-Ni separation of meteorite shower after explosion at atmosphere of the Earth.

2. Tweedy and lamellar textures from meteorite explosion:

Natural examples of tweedy lamellar textures are found also from Nio spherules due to meteorite shower. This texture will be new fact to form quasi-Widmannstaetten texture of iron meteorites from quick shock wave explosions with other types of chemical composition of P,S,Al,Si and Fe,Ni.

3. Fe-Ni separation from meteorite explosion:

Fe-Ni separation is found from spherules and melt fragments from the Nio chondritic meteorites.

4. Ni-S formation of Sudbury Basin :

Ni-S sulfide deposit of Sudbury Basin of Canada is formed after meteoritic impact. Fe minerals are found beyond the crater structure. This is the first proof to make Ni-S deposit after large impact of asteroids.

5. Conclusion:

Present results are summarized as follows:

1) Fe and Ni separation from meteorite impact is proved from meteoritic shower explosion of the Nio chondritic meteorite from Yamaguchi, Japan.

2) Spherules and melt fragments of 118 analyzed grains with Fe-Ni bearing particles show that 1) Fe and Ni are separated, 2) Ni combines with S, and 3) new tweedy and lamellar textures are formed with Fe-Ni with chondritic elements of P,S,Al, and Si.

3) Fe-Ni separation after explosion of meteorite shower indicates that the Sudbury Ni-S deposits are proved to be formed naturally by meteoritic impact reaction of the asteroids.