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Meteorites: What can we learn using Mössbauer spectroscopy?

Michael I. Oshtrakh

*Department of Experimental Physics
Institute of Physics and Technology
Ural Federal University,
Jekaterinburg, Russian Federation*



pondělí **6. listopadu** 2017
od **15:45** (cca 1 hod)
učebna **LP-1.128**
17. listopadu 12

Anotace

Study of extraterrestrial matter is very important due to a number of reasons, such as: (i) analysis of Solar system evolution, (ii) investigation of the extreme conditions effects on minerals formation, (iii) analysis of thermal history of matter, (iv) study of structural and chemical variations in space minerals, etc. The main space messengers reached Earth are various meteorites which can be classified in several groups related to their origin and chemical composition. There are iron, stony-iron, and stony meteorites. All meteorites contain iron-bearing minerals. Therefore, Mössbauer spectroscopy is a useful tool for the study of extraterrestrial materials with very complex composition which was successfully applied for meteorites investigation more than 55 years.

It was possible to identify the main iron-bearing minerals and their relative composition, the processes of their weathering with estimation of their terrestrial age, the distribution of Fe^{2+} and Mg^{2+} in silicate minerals, an analysis of the thermal history of silicates, systematics of ordinary chondrites from H, L and LL groups using Mössbauer parameters. Some examples of meteorites study at the Ural Federal University using Mössbauer spectroscopy with a high velocity resolution (the high order of the velocity reference signal discretization) will be presented.

Sekretariát

Telefon | 58 563 4151
DIČ | CZ61989592
Číslo účtu | 19-1096330227/0100
Adresa | 17. listopadu 12, 771 46