

# Preface

There are three keywords in title of this book. *Mechanochemistry* is a branch of science concerned with chemical and physico-chemical changes of solids due to the influence of mechanical energy. Very frequently, the small particles are product of this mechanical treatment. *Nanoscience* is a branch of science dealing with particles less than the size of 100 nm, giving to nanostructures built from them extraordinary properties. It has been experienced that mechanochemistry and nanoscience have impact on several technologies. *Minerals engineering* as well as many others applications serves as an good example.

The first chapter *Mechanochemistry in Nanoscience* deals with both disciplines. History, theories and models and synthesis routes are described. Special attention is devoted to nanogeoscience and application of nanoparticles in medicine which is hot topic for scientists and technologists.

The second chapter *High-Energy Milling* is devoted to energetically intensive treatment with which special structures in mechanochemistry and nanoscience are created. Various mills are described, the process variables which govern their mechanical effect as well as important phenomena accompanying the milling process.

Special techniques needed for investigation and characterization of solids in mechanochemistry and nanoscience are described in the third chapter named *Selected Identification Methods*.

The fourth chapter *From Minerals to Nanoparticles* show many examples how it is possible to obtain nanoparticles from minerals.

*Mechanochemistry in Minerals Engineering* is exclusively described in the fifth chapter. Here, various combinations of mechanochemical processing is illustrated for extraction of elements from minerals as well as their behaviour in leaching and sorption operations.

The largest sixth chapter *Applied Mechanochemistry* is devoted to applications of mechanochemistry in various technological fields. The effect of high-energy milling on particles (very frequently in nanodimensions) in scaled-up processes is illustrated for technological applications in mineral processing, extractive metallurgy, chemical engineering, materials engineering, coal industry, building industry, agriculture, pharmacy and waste treatment.





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