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Interdependence of Fundamental and Applied Research in Material Science

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Abstract:

Development of materials with desirable properties essentially depends on realization of interdependence: natural science \Leftrightarrow technical sciences. Taking this into account, in order to develop of new advanced materials it is essential to determine principles that characterize this interdependency.

Therefore, in this article the principles of fundamental research and the importance of obtained results are considered and implemented in the field of technical realizations.

Keywords: *Fundamental and applied sciences; Materials science; Advanced materials.*

1. Causal Relationship Between Fundamental and Applied Research in Material Science

Theoretical achievements of fundamental research are the basis of experimental applied research. Basically, the applied research is focused on solving the practical problems or on investigations of scientifically founded solutions which represent the foundation for engineering achievements.

The explosive development of material science in second half of the last century was the result of fundamental research in physics, chemistry and mathematics. Consequently, such multidisciplinary science became the basis for various new technologies without which there wouldn't be development of modern electronics, machinery construction and space technology as we know it.

There is a causal relationship among individual science disciplines as shown on diagram 1.

This kind of relationship between fundamental and applied natural sciences, as well as technical sciences, obviously proves that those are only links of one unique chain of science without which there is no and there could not be any development.

Regardless of this, very often the applied research is unjustifiably being opposed to fundamental research. However, the fact is that the fundamental sciences are focused on search for truth, while applied ones are intended to offer the answer on how to organize results of fundamental sciences.

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