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Editorial corner – a personal view
Knowledge and technology transfers: What is going on?

J. Karger-Kocsis[*]

Department of Polymer Engineering, Faculty of Mechanical Engineering, Budapest University of Technology and Economics, Műegyetem rkp. 3., H-1111, Budapest, Hungary

Grouping in materials science usually distinguishes ceramics, metals and polymers. Their developments were never independent of each other though sometimes the interaction might have been implicit (for example between metallic alloys and polymer blends). New findings, achieved with one of the above materials triggered interest to copy them in the others. The related knowledge transfer was, however, not always smooth. For example the concept of phase transformation toughening, working well in metals and especially in ceramics, could not be adapted for polymers (at least according to the original principle). By contrast, the success with shape memory alloys is the present driving force for the extensive research on shape memory polymers ('forerunners' of which were termed to heat shrinkable systems). Sol-gel techniques of ceramics' production are now adapted to prepare polymer nanocomposites. The winners among the research concepts were always those that have been 'borrowed' from the nature. The related bioinspired, biomimetical approaches have been followed in materials' development (self healing – not restricted for polymeric materials), design and construction (skeletal framing, local reinforcements), and even in the production (lean manufacturing, net shape processing). A strong interplay can be noticed also for processing/shaping technologies. Again, the related transfer was not always a success story. For example roll forming, extensively used for metallic sheets, did not reach breakthrough with polymeric composites. On the other hand, the equal channel angular pressing/extrusion of metals is now a preferred research direction for polymers. This technology represents the revival of the solid phase forming processes of polymers whereby the knowledge and know-how, acquired for metals, are being fully exploited. Another recent 'metal triggered' development for polymers and related composites concerns joining. Friction stir welding for example seems to be well adaptable for polymeric systems. Solid phase high-energy ball milling, well established for the preparation of special metals and ceramics, may be a useful tool to disperse carbon nanotubes in suitable oligomers and polymers.

How to keep updated with such 'transfer phenomena'? First, do not attend only the lectures of your peers at conferences, and second, as scientist or engineer be always ready to face new challenges. To be able to think in analogies is the minimum task for researchers, is not it?

Prof. Dr. Dr. h. c. József Karger-Kocsis
Editor-in-Chief

[*]Corresponding author, e-mail: karger@pt.bme.hu