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INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

POLYMER SCIENCE LANGUAGE TO BROADER CHEMICAL COMMUNITY THROUGH ARTS (SCIART)

Introduction of Polymer Science Language to Broader Chemical community through Arts (SciArt)

The project “Introduction of Polymer Science Language to Broader Chemical Community through Arts (SciArt)”, sponsored by the International Union of Pure and Applied Chemistry (IUPAC) and the University of Chemistry and Technology Prague, aims on combining the two traditionally related worlds of Science and Arts, in order to introduce the spectator to the exact and often abstract language of chemical terminology.

Through their joint efforts, the chemist Jan Merna, painter Jan Pražan and graphic designer Luděk Joska are endeavouring to introduce basic terms of Polymer Science to the broader chemical community on the 100th anniversary of German chemist Hermann Staudinger’s ground-breaking concept of polymers structure, published in 1920. Staudinger’s main idea lies in the understanding of the chemical structure essence of classical polymers. This is based on macromolecules: giant molecules that form the majority of synthetic plastic and rubber, which stands behind the quality, safety and sustainability of our daily lives, as well as polymers made by Nature to create our bodies and store the genetic code of life form known on planet Earth, the macromolecules of proteins, cellulose and nucleic acids.

The authors would like those who are initially attracted by the Arts to challenge themselves to understand the selected terms of primary importance to Polymer Science and to differentiate between closely related terms (e.g. macromolecule vs. polymer). The original documents, which contain precise definitions created by members of the Subcommittee on Polymer Terminology within the IUPAC Polymer Division, are freely accessible from IUPAC web page. Therefore, those with a deeper interest in macromolecules can understand the terms in detail, then perhaps come back to the paintings and see to what extent the artworks illustrate reality and to which they are the artistic license. We hope you enjoy the exhibition and we appreciate your devoted efforts to better understand the languages of Science and Arts.

Authors.

POLYMER

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1 A substance composed of macromolecules.

MACROMOLECULE (POLYMER MOLECULE)

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2

A molecule of high relative molecular mass, the structure of which essentially comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass.

MONOMER MOLECULE

3

A molecule which can undergo polymerization, thereby contributing constitutional units to the essential structure of a macromolecule.

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POLYMERIZATION

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4

The process of converting a monomer or a mixture of monomers into a polymer.

NETWORK

5

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A highly ramified macromolecule in which essentially each constitutional unit is connected to each other constitutional unit and to the macroscopic phase boundary by many permanent paths through the macromolecule, the number of such paths increasing with the average number of intervening bonds; the paths must on the average be co-extensivewith the macromolecule.

POLYCONDENSATION

6

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A polymerization in which the growth of polymer chains proceeds by condensation reactions between molecules of all degrees of polymerization.

TACTIC MACROMOLECULE

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7

A regular macromolecule in which essentially all the configurational (repeating) units are identical.

STAR MACROMOLECULE

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8

A macromolecule containig a single branch point from which linear chains (arms) emanate.