colloids and interfaces

MDPI

Editorial

Editorial for a New Section: Interfacial Properties

Volodymyr I. Kovalchuk [1,*] and Eugene V. Aksenenko [2,*]

[1] Institute of Biocolloid Chemistry, National Academy of Sciences of Ukraine, 03142 Kyiv, Ukraine
[2] Institute of Colloid Chemistry and Chemistry of Water, National Academy of Sciences of Ukraine, 03680 Kyiv, Ukraine
* Correspondence: vladim@koval.kiev.ua (V.I.K.); eugene_aksenenko@ukr.net (E.V.A.)

From a physical point of view, interfaces are not simply borders between two contacting continuous phases, but material objects with specific properties. This allows us to consider them as separate 2D phases, which are however not fully autonomous as their properties depend on the adjacent bulk phases. Studies on interface properties, e.g., mechanical, thermodynamic, chemical, electrical, optical, etc., constitute the most significant part of colloid science. Such studies require specially developed experimental methods and theoretical approaches.

Interfaces are important elements of any heterogeneous multiphase system. The higher is the total area of interfaces per unit volume of the system (specific area), the larger is the effect of interfaces on the properties of the whole system. By modifying the properties of interfaces, one can modify the properties and functionality of heterogeneous systems. The properties of liquid interfaces can be modified easily by adding components to the system, which preferentially adsorb at the interfaces. These components can be various modifying agents, in particular, low-molecular-weight surfactants, polymers, proteins, (nano)-particles, and their mixtures. For solid surfaces, there is a variety of physical and chemical methods to modify their properties.

In many practically important processes, interfaces act under dynamic conditions. The dynamic properties of interfacial layers can be significantly different from their equilibrium properties and can depend on mass transfer processes within the bulk phases and within the interfaces themselves. Moreover, they depend on the characteristic time scale and magnitude of external disturbances. Understanding the dynamics of interfacial layers under various conditions (composition, temperature, rate of deformation, flow rate, etc.) could be key to understanding the dynamics and variation in properties of more complex multiphase systems. In turn, studying the properties of macroscopic multiphase systems we can obtain important information about molecular-level processes within very thin interfacial layers.

The discussion above shows that studies of interfaces require multidisciplinary approaches, combining knowledge of physics, chemistry, material and polymer science, mathematics, computer science, and others. The situation is especially complicated in the case of biological interfaces, where specific knowledge about biological systems and processes becomes important. On the other hand, the information obtained in studies of interfaces can be of great interest for specialists working in very different scientific areas.

The aim of this Section is to present the most recent results on all types of interfaces formed between different bulk phases under various equilibrium and dynamic conditions. This also includes new experimental methods and methodologies, as well as new approaches for modeling interfacial properties. All published papers should contribute to the advancement of this specific area of science and promote the application of colloids

Check for updates

Received: 16 April 2026
Accepted: 17 April 2026
Published: 20 April 2026

Copyright: © 2026 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

and interfacial aspects in chemistry, biology, and medicine, as well as in industrial areas, such as water preparation and purification, catalytic processes, cosmetics, material science, polymer, food, pharmacy, the mining industry, and many others.

Conflicts of Interest: The authors declare no conflicts of interest.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

https://doi.org/10.3390/colloids10020032