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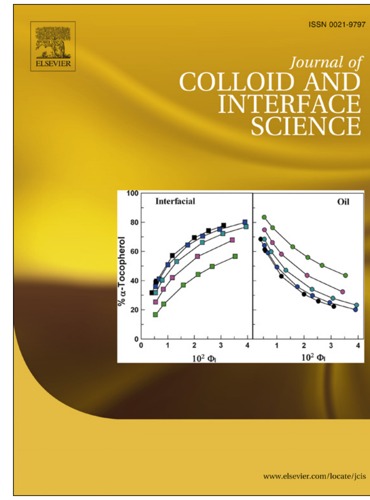

Colloidal models. A bit of history

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Colloidal Models. A bit of History.

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ABSTRACT

This paper offers an anthology on developments in colloid and interface science emphasizing themes that may be of direct or indirect interest to Interfaces Against Pollution. Topics include determination of Avogadro's number, development in the insight into driving forces for double layer formation, colloid stability, thin films, and thermodynamic approaches in interfacial electrochemistry. Some personal reminiscences of key players in the field are included, partly to illustrate historical developments.

KEY WORDS
Model colloids; colloids as models.
Electric double layers in disperse systems
Thin liquid films.
Thermodynamic approaches.
Historical notes

1). INTRODUCTION.

Colloid science is an old discipline, older than polymer science, atom theory, quantum mechanics, biochemistry, electrolyte solution theory and environmental science. And, for that matter, older than its offsprings nanoscience and soft matter science. The oldest illustrations of systems that we nowadays recognize as "colloidal" date back to half the 19th century: the names of Selmi (1845)', Baudrimont (1846), Graham (1861), Nägeli (1858), Van Bemmelen (1877) and many others are connected to this early history. Different as these investigators might have been, they had one item in common, namely their interest into the existence of a state of matter that was dispersed on the nano to microscale. Nowadays we would say: between molecular and macroscopic level, but at that time the notion of molecules was not yet fully established, let alone any insight into their sizes. The materials studied in these investigations ranged from inorganic (sulphur, Prussian blue, silver chloride,....) to biological (agar, starches, proteins,...). This variety of systems is typical: the state of matter was and remains the binding principle rather than the specific properties of the model systems. Historically, various terms for such systems were suggested, like pseudosolutions, demulsions, and micelles. The term "colloid" was coined by Graham. It stems from the greek κολλα, meaning glue, but most colloids do not have this property. With time the meaning of terms may have changed, but for science that does not matter as long as everybody agrees. As an example, the word "atom" comes from the greek ατομος meaning indivisible, but nowadays everybody speaks with impunity of nuclear fission.

Over the almost two centuries since its inception, colloid science has matured together with physical sciences in general and so did the interaction between these disciplines, with mutual benefit. Often colloids have provided model systems to test physical laws, but in turn, physics and chemistry have provided colloid science with excellent tools and measuring techniques. For example, nowadays well-defined colloids act as models for the understanding of liquid matter and statistical thermodynamics have been essential in understanding the