4th International Colloids Conference

SURFACE DESIGN AND ENGINEERING

15-18 June 2014
Madrid, Spain

Dear Delegates,

On behalf of the Organizing Committee, it is our pleasure to welcome each of you to the historic and beautiful city of Madrid for the Fourth International Colloids Conference, "Surface Design and Engineering." Previous conferences were held in Amsterdam, and last year's conference in Xiamen, China. The Colloids Conferences are associated with the *Journal of Colloid and Interface Science [JCIS]*, the oldest and most respected journal in colloid science.

This year's conference features an interesting program of plenary, keynote, invited and contributed presentations and posters at the frontiers of designed and characterized surfaces having important present and future applications. Allow us to express our appreciation to all of the speakers and poster presenters for their vital contributions to this conference. We are pleased by the quality and quantity of abstracts received. The topics of the presentations include:

- Emulsions
- Interfaces in biology and food
- Patterned surfaces
- Photonics at interfaces
- Polymer surfaces and interfaces
- Self-assembled structures
- Sensors
- Structured particles and nanoparticles

Let us take this opportunity to thank the Editors of *JCIS*, Professors Teresa Bandosz, , Martin Malmsten, Gao-Qing (Max) Lu, Darsh Wasan, and Dongyuan Zhao for their strong support in sustaining the reputation of *JCIS* and in organizing this conference series. Our thanks likewise to the staff of Elsevier, Rob van Daalen, Laura Copeland, Neha Aggarwal, and Irene Cyrilraj for their guidance and hard work. To the local organizing committee, Professors Begoña Ferrari, Elena Junquera, and Enrique López-Cabarcos, we express our gratitude for their tireless effort and dedication in planning and organizing this conference.

Our thanks to the sponsors of this conference for their interest and generous support.

Again, welcome! We wish you a very enjoyable stay in Madrid and a stimulating and illuminating conference.

Professors Manuel Arturo López-Quintela, Julian Eastoe and Arthur Hubbard

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Formation of magnetic phase in inter-packet spaces of clay minerals

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Using magnetic composites of clay minerals for sorption of heavy metals, as well as for industrial wastewater treatment from heavy metal ions is today an extremely urgent task. Since contamination with heavy metal ions have a high risk for the population of the world at the moment there is a significant need for high performance, reliable and cost-effective techniques to remove them from wastewater. New magnetic properties of magnetic composites allow natural minerals to ensure the removal of targets in high-speed mode. In addition, the incorporation of magnetic iron nanoparticles on solid supports is also an important and fruitful area of modern chemistry. So today is very actual creation of magnetic composites of natural minerals, as they are low cost and easy availability. The literature data has very little information on the development of the incorporation of iron particles on aluminosilicate minerals. Therefore, we can say that today the problem is intensifying processes of magnetic composites of clay minerals, and exploring their different properties to create effective technology that will be beneficial in the economic and an environmental term are not sufficiently studied and requires thorough investigation. In this regard, the aim of this work was the preparation of magnetic nanoparticles of natural minerals such as montmorillonite, kaolinite and study their properties.

We have investigated the magnetic clay by XRD, and it was shown that the magnetic composites are composed of kaolinite, quartz SiO_2, muscovite, maghemite and magnetite. XRD analysis of the magnetic composites of montmorillonite showed that he has composed tibiskumit, cristobalite, quartz, magnetite and maghemite. And during the XRD analysis of the resulting magnetite in the absence of minerals has been known that the sample contains a large amount of maghemite, which is a magnetic iron oxide modifications. This fact was also confirmed by a vibrating sample magnetometer, it was known that the values of the magnetization in the magnetic montmorillonite were lower than the composite magnetic kaolinite, due to the dimensions of the corresponding inter-packet spaces mineral kaolinite, which is equal to 715 Å, and montmorillonite for 94 -214Å.

Thus, magnetic composites were prepared magnetic composites of clay minerals by coprecipitation and peptization, and studied the phase state of the iron in them. According to XRD analysis of all samples were found particles of magnetite and maghemite.

Keywords: Diatomite, Magnetite, Maghemite, Kaolinite