SoBlue: A Pigment from the Past with a New Future. Nanosized Halloysite Clay-Colorant Composites

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Clays are minerals, usually aluminosilicates, characterized by a noticeable variety of structures and physical and chemical properties. Their relevance is not only limited to geology, as it is also extended to numerous fields of science and technology: from agriculture to catalysis, from fine chemistry to pharmacology and, most importantly, nanotechnologies. One of the most fascinating applications of clays occurs in the field of arts. Some of them indeed allow the stabilization of various organic pigments, which would otherwise be easily degradable by thermal and chemical effects, and hinder their fading through ages. An example of this interaction between clay and pigment is Maya blue, formed by palygorskite clay and indigo, already known to the people it is named after and nowadays synthesized in laboratories by grinding the two materials together and making the resulting solid undergo a heating treatment. This projects aims to synthesize a new indigo-clay composite, Sobrero's Blue (SoBlue), which is similar to Maya blue but differs in the clay: halloysite. It derives from kaolin and it is characterized by a particular tubular structure resembling a rolled scroll. This particular structure permits the absorption and protection of a variety of organic molecules, including many colorants. Firstly, halloysite affinity to some of these organic colorants has been tested, as well as the stability of the obtained complexes when attacked by mineral acids. Secondly, SoBlue has been synthesized and its stability has been tested using the same methods. Lastly, the complex has been characterized using various analyses: UV-Vis spectroscopy, scanning electronic microscopy and thermogravimetric analysis.

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