How paint was made by artists? Interactions between clays and proteins

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Since the ancient times, humans have developed painting techniques with various materials such as earth or ochre for pigments and wax, egg, or animal glue for binding media. The *tempera* technique, which mixes animal glue or egg with pigments, was widespread during the Middle Age. Around 1420, thanks to Van Eyck, oily medias spread and superseded the *tempera*. It was the most used technique during the Renaissance. However, some artists like Pieter Brueghel the Elder (16[th]c.) and Nicolas Poussin (17th c.) reused the old technique in some of their artworks. What were their motives? What are the properties of such a painting technique?

To understand these mixtures, painting recipes were studied. They enabled to prepare model samples. The selected systems are based on green earths composed mostly of mica and smectite. Grinding at different levels the later allow, after mixing with biomolecules present in animal glue or eggs, to obtain special rheological properties. NMR relaxometry is used in this study to understand these interactions by investigating the dynamics on a wide timescale.

The painter recipes are studied step by step. First, a simple system made of phyllosilicate in water is considered. It points out discrepancies between the different minerals. Then to get closer to the paint recipes, the second step is the addition of a protein - egg albumin or animal glue- to the previous mixture. In this poster, we will present some preliminary results on these model samples.