Forecast of the Chemical Aging and Relevant Color Changes in Paintings

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The presentation offers and describes the application of thermodynamic simulation to the problems of chemical aging of paintings. The numerical results were obtained by applying the method to various mixtures of pigments without and with atmospheric components. The simulation results in a qualitative form were compared to the legendary recommendations on incompatible pigment mixtures with about an 80% match regarding potential color changes in the aged mixtures of pigments. Results for the cadmium yellow/lead white and the cadmium lemon/emerald green mixtures are illustrated by color pictures, created upon the simulation results. This novel approach to the analysis of aging of paintings, which up to the present time is being investigated exclusively at the verbal level, offers a new powerful tool to explore old masterpieces, to assist in developing new materials, and to forecast/explain some aspects of the aging of real masterpieces and the art materials.