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(57) Abstract :
The study on the swelling kinetics of binders used in the paint industry at room temperature revealed that the First-order absorption kinetic model effectively captures the swelling behavior across different crosslinker concentrations. The model's strong alignment with experimental data is demonstrated by R-Square values of 0.98596, 0.97966, and 0.96814 for 0%, 5%, and 10% crosslinker concentrations, respectively. Furthermore, the low Chi-Square values (1.08042, 1.16365, and 1.15208) and Root Mean Square Error values (0.98596, 0.97966, and 0.96814) reinforce the model's precision. These results underscore the First-order absorption kinetic model as the optimal approach for accurately characterizing the swelling properties of the polymer across varying crosslinker concentrations.

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