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STUDY OF THE INHIBITION OF CORROSION OF CARBON STEEL BY TIOPHENIC DERIVATIVES

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Introduction:

Corrosion is a major global problem that strongly affects the industrial environment. Due to their availability, low cost, ease of fabrication, and high strength carbon steel is the most commonly used materials in industry, unfortunately and despite all these carbon steels advantages frequently suffer from serious corrosion when they are exposed to aggressive media. However, pretreatment can strengthen the steel layer and improve the corrosion resistance of the steel [1-3].

Materials and Methods:

Mass loss measurements remain a first approach for studying the corrosion inhibition of a steel in an electrolytic solution. this method is one of the methods for evaluating the corrosion of a metal exposed to a corrosive solution. The mass loss method is simple to implement and does not require heavy equipment.

Results:

Gravimetric measurements show that the corrosion rate decreases in the presence of APTC and ATTC. Their inhibitive action is better expressed by the inhibition efficiency which increases with inhibitor concentration to reach near 90 and 96% at $7.5 \times 10^{-4} M$ for APTC and ATTC respectively.

Conclusion:

These results show that in the presence of the inhibitor APTC and ATTC, carbon steel protects itself against degradation

References:

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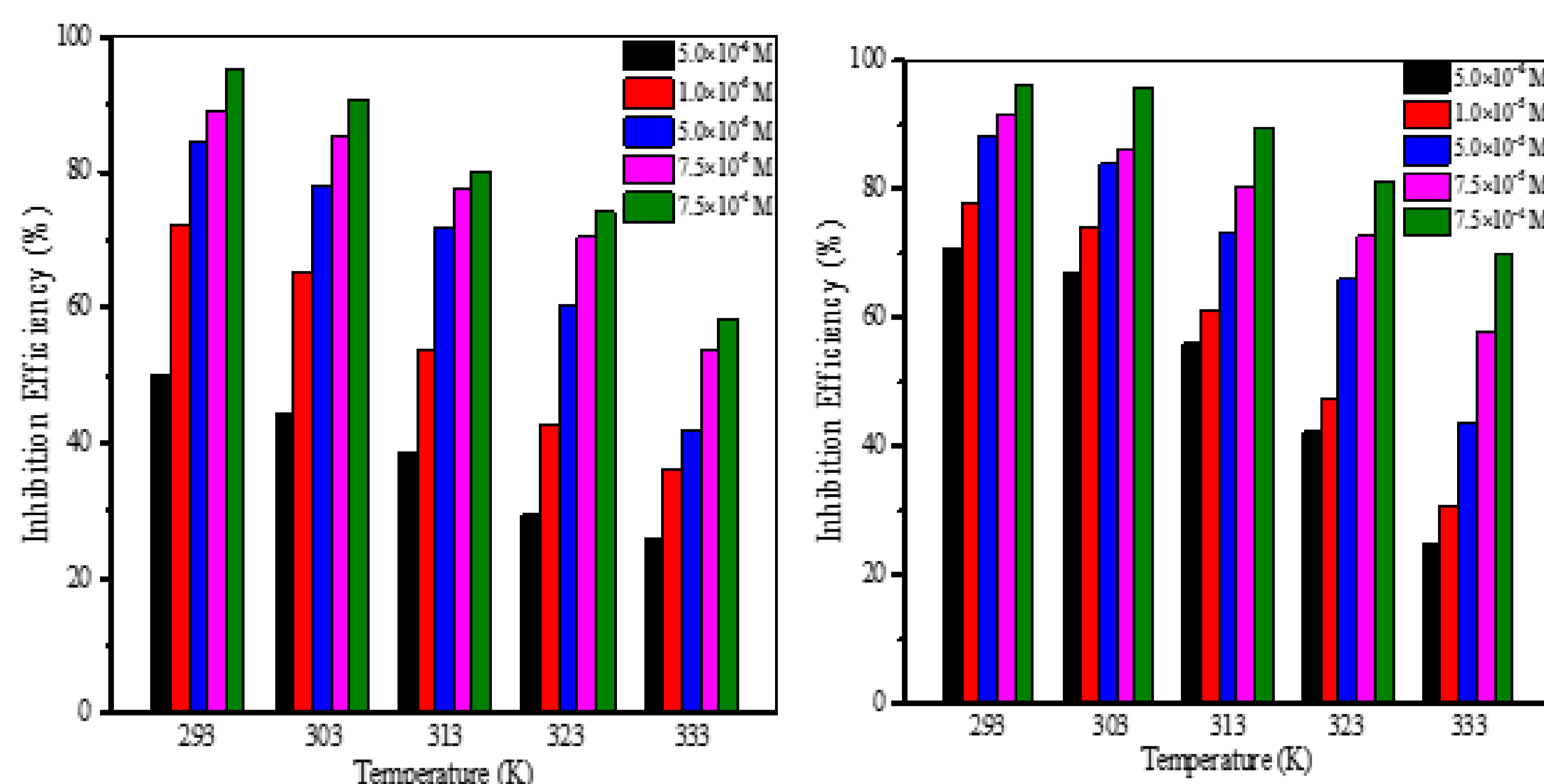


Figure1: Variation of inhibition efficiency (*IE*%) with solution temperature (293–333 K) at different concentrations of Acetophenone (left) and Methyl acetophenone (right).

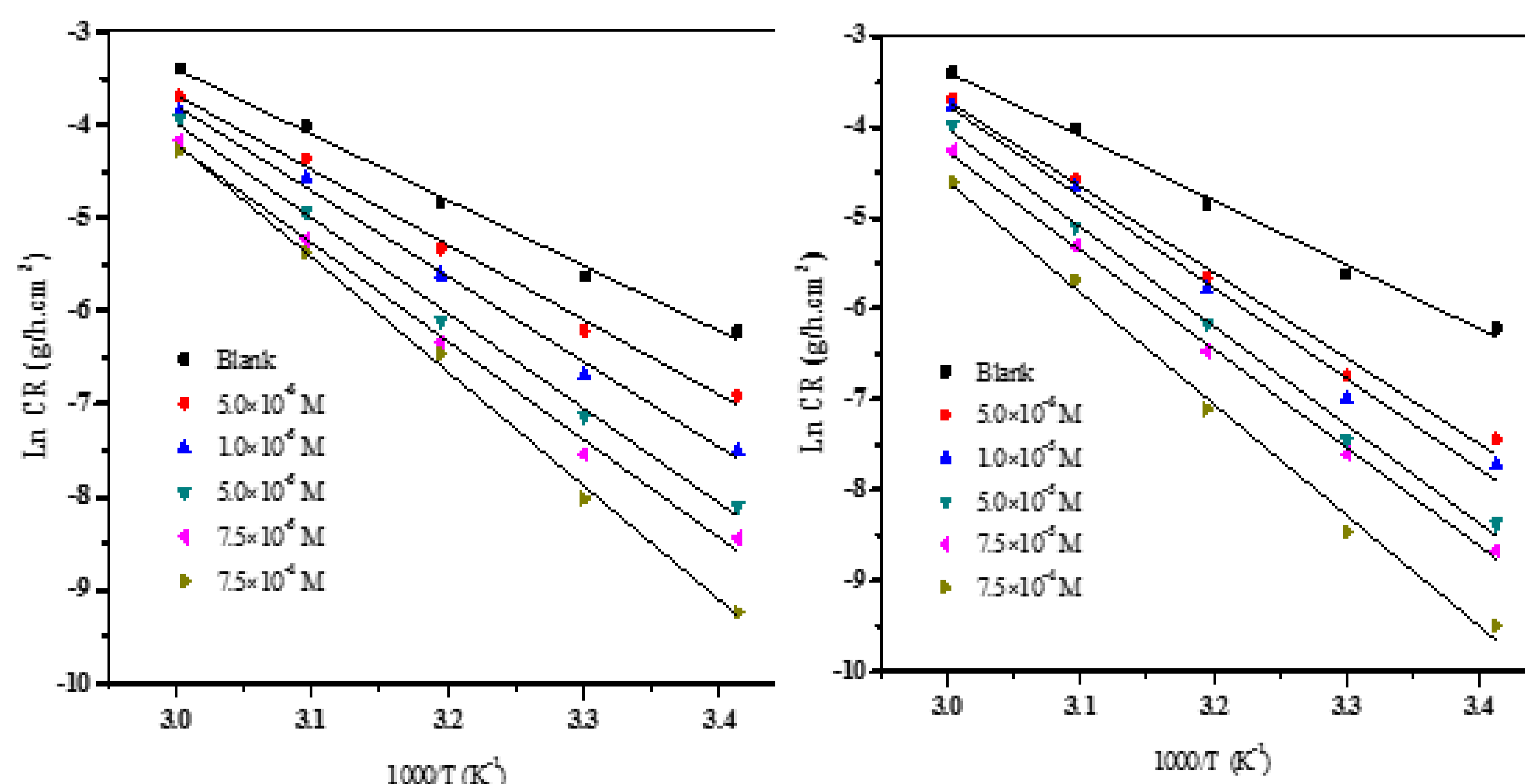


Figure2: Arrhenius Plot for the Dissolution of Carbon Steel in 1 M $HClO_4$ with and without of different concentrations of Aceto (left) and Methylaceto (right) at various temperatures.

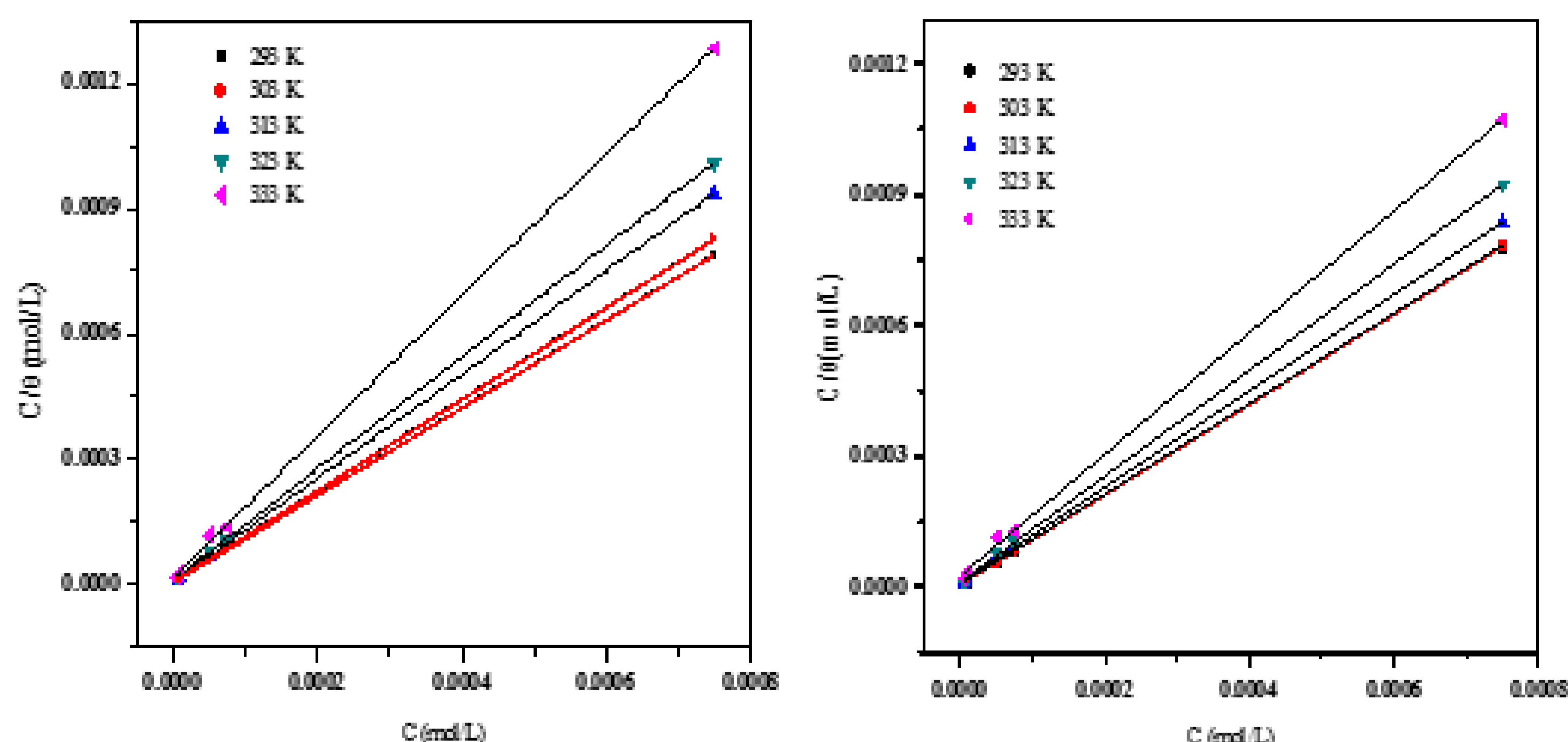


Figure3: Langmuir adsorption isotherms for Acetophenone (left) and Methylaceto (right).