



Photocatalytic degradation of paracetamol and procaine

AlaaJawad Abdul-Zahra^{1*}, MuthanaSaleh Mashkour²,
AmerMuosa Juda²,HanaaAddai Al-Sultani¹

¹Branch of chemistry , Faculty of pharmacy, ²Chemistry Department, Faculty of Science,University of Kufa, Najaf, Iraq.

Abstract:The current study is designed to treat the solutions of paracetamol and procaine by using UV light withusing of ZnO as catalyst. This study explained the importance of the UV light and catalyst as a basic factors in the photocatalytic degradation for both paracetamol and procaine. An attempt has been done to study the effect of process parameters through amount of catalyst, concentration of drugs, pH of drugssolution and temperature on photocatalytic degradation of drugs solution.

The experiments were carried out by varying pH equal to 2-12, amount of catalyst from 0.01 to1g,initial concentration of drugsfrom5 to 40 μ g/ml and temperature rangefrom15 to55 $^{\circ}$ C. The optimum catalyst dose was found to be equal to 0.025 g and 0.1 g are considered the optimum weights of paracetamol and procaine respectively. In the case of ZnO maximum rate of photoreaction of drugs solution was observed in the increase of pH of reaction solution for both drugs have a positive effect represented by increasing the degradation rate until the pH 8 and 4 are the best acidic function of the paracetamol and procaine respectively.

Photocatalytic degradation was found to increase with increasing temperature. Arrhenius plot shows that the activation energy is equal to 8.95 KJ. mol⁻¹ for paracetamol and 15.67 KJ. mol⁻¹ for procaine.The thermodynamic parameters of the photodegradation of drugs, like energy of activation, enthalpy of activation, entropy of activation and free energy of activation revealed the efficiency of the process.

Keywords:Decolorization; paracetamol and procaine; Photocatalysis.