

# DEVELOPMENT OF ZINC SULPHATE CONTROLLED RELEASE FERTILIZER SAND AS INERT MATRIX WITH NAPHTHALENE COATING

D Kamalakar, L Nageswara Rao, P Rohinikumar, M Venkateswara Rao  
Department of Chemical Engineering, R.V.R & J.C College of Engineering, Guntur- 522019, India

## ABSTRACT

The paper presents controlled release of Zinc sulphate fertilizer made with sand as inert matrix. Pellets were made from the mixture and the release rate of zinc sulphate with time was studied. The parameters covered are fractional zinc sulphate, fractional cement and fractional sand and diameter of the inert particle size, diameter of the pellet. The parameters were also measured with Naphthalene coating pellets and compared. The release rate expression was obtained and represented here under.

$$\begin{aligned} \text{For first order:} \quad k &= 0.895 (d_p / d_s)^{-1.43} f_m^{-1.76} f_b^{0.65} f_{Znso4}^{0.64} \\ \text{For zero order:} \quad k &= 0.533 (d_p / d_s)^{-1.209} f_m^{2.59} f_b^{0.5} f_{Znso4}^{0.435} \end{aligned}$$

The study is useful to identify the controlled release of zinc sulphate fertilizer and also to predict the release rate at any instant of time.

**KEY WORDS:** Controlled release, Release rate, Fertilizer, Inert matrix, Binding agent