

## Solubility of an Erlotinib hydrochloride drug in supercritical carbon dioxide: Experimental and modeling

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### Abstract:

In this study, solubility of Erlotinib hydrochloride in SC-CO<sub>2</sub> was determined using a static method at pressures and temperatures ranging within 12–27 MPa and 308.2–338.2 K, respectively. Also, the solubilities of Erlotinib hydrochloride in SC-CO<sub>2</sub> + Ethanol, as a ternary system, were determined. The solubility of Erlotinib in the binary system was found to range from  $1.31 \times 10^{-6}$  to  $1.02 \times 10^{-4}$  mole fractions, while that in the ternary system exhibited solubility values between  $3.80 \times 10^{-5}$  and  $9.54 \times 10^{-4}$  mole fractions, indicating the significant effect of adding ethanol on the solubility of Erlotinib in SC-CO<sub>2</sub>. In addition, the solubility of Erlotinib in both systems was correlated to empirical and semiempirical density-based models.

**Keywords:** Erlotinib hydrochloride, SC-CO<sub>2</sub>, Ethanol, Semiempirical equations