

BioNanoScience 2017 vol.7 N2, pages 340-344

---

# Effect of Solid Dispersions on the Dissolution of Ampicillin

Krasnyuk I., Beliatskaya A., Stepanova O., Korol L., Valeeva A., Grikh V., Ovsyannikova L., Kosheleva T.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

## Abstract

© 2016, Springer Science+Business Media New York. In this work, we studied water solubility of ampicillin trihydrate and its solid dispersions (SD) with polyethylene glycol-1500, polyvinylpyrrolidone-10000, and  $\beta$ -cyclodextrin. It was found that SD formation increases the solubility by a factor of 1.34–1.73 and the rate of ampicillin dissolution by a factor of 3.43–7.40. The results of complex physicochemical studies suggest that the improved release of ampicillin from SD is due to its micronization and solubilization by the polymer.

<http://dx.doi.org/10.1007/s12668-016-0342-6>

---

## Keywords

Ampicillin trihydrate, Polyethylene glycol-1500 (PEG), Polyvinylpyrrolidone-10000 (PVP), Solid dispersions, Solubility,  $\beta$ -Cyclodextrin

## References

- [1] Krasnyuk, I. I., Jr., Ovsyannikova, L. V., Nikulina, O. I., Beliatskaya, A. V., Krasnyuk, I. I. (2014). The study of the solubility of diclofenac acid from solid dispersions. *Pharmaceutical Chemistry Journal*, 48(11), 23–27.
- [2] Kessler T., Breitenbach J, Schmidt K, Degenhardt M, Rosenberg J, Krull H. (2006). Device for preparing solid dispersion of active ingredient. US Pat. 60/781,398.
- [3] Beyerinck RA, Deibele HLM, Dobry DE, Ray DJ, Settell DM, Spence KR. (2004). Method for making homogeneous spray-dried solid amorphous drug dispersions utilizing modified spray-drying apparatus. US Pat. 6763607 B2.
- [4] Kowalski, I. V., Krasnyuk, I. I., Krasnyuk, I. I., Jr., Nikulina, O. I., Beliatskaya, A. B., Kharitonov, U. Y. (2014). Mechanisms of pharmacological action routine (review). *Pharmaceutical Chemistry Journal*, 48(2), 3–6.
- [5] Tkachenko, M. L., Smelova, S. G., Zhnyakina, L. E., Pavlova, L. V. (2006). The solid dispersions of phenylbutazone as the hydrophilic medium. *Pharmacy*, 3, 31–35.
- [6] Maksimenko, O. O., Ravikumar, S., Andreev, S. M., Krasnyuk, I. I., Vasilyev, A. E. (2001). Stability of transdermal therapeutic systems with indomethacin. *Pharmaceutical Chemistry Journal*, 35(11), 53–55.