

## **Kinetics of bioactive compounds extraction from plant material using boiling solvent**

Salamatin A., Khaziev R., Makarova A., Ivanova S.  
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

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### **Abstract**

© 2015, Pleiades Publishing, Ltd. A model of extracting the natural products through boiling ground plant material in a solvent using a bain-marie is proposed. The model trait is that it has only one adaptation parameter, i.e., the diffusion coefficient of the solute in the plant material, which depends on the solvent and plant material properties. The model is applied to study the kinetics of extraction, and the minimal solvent volume, which is used for extraction, is theoretically determined. A comparison of the model with the experimental data of the extraction of hydrophobic diterpene acids from sage leaves and hydrophilic flavonoids from common knotgrass herb is in good agreement with the experiment. Experiments performed with finely ground plant material (particle diameter is less than 1 mm) show that, for most extraction conditions, more than 90% of the target compounds are extracted by the time the solvent starts to boil.

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### **Keywords**

diterpene, extraction kinetics, flavonoid, mathematical simulation