

The present paper dealt with the influence of the common juniper berries pretreatment on the yield, chemical composition and extraction kinetics of juniper essential oil (JEO) obtained by classical (HD) and microwave-assisted hydrodistillation (MAHD). The highest JEO yield was obtained by HD from one-minute dry-ground juniper berries (2.23 ± 0.00 g/100 g). No statistically significant influence of swelling and distillation technique on JEO yield was observed. Therefore, the optimal pretreatment process involved no swelling and one-minute grinding. However, no significant difference in the chemical composition of the JEOs obtained by the two techniques was observed. A new phenomenological kinetic model was developed on the basis of the mechanism of JEO extraction by both HD MAHD, which assumed three simultaneously-occurring stages: washing, unhindered diffusion and hindered diffusion. The main advantage of developed model was its ability to describe the variations of JEO yield and distillation rates with time. Furthermore, it had the smallest mean relative percentage deviation compared to the well-known kinetics models and the parameters that all were statistically significant, so it was recommended for modeling the kinetics of JEO extraction by HD and especially MAHD.