

**Widomski, M.K., Kowalska, B., Kowalski, D. Model Investigations into the Propagation of Butylated Hydroxytoluene (BHT) Migrating from High Density Polyethylene Pipes (HDPE) to Water. *Ochrona Srodowiska* 2012, Vol. 34, No. 3, pp. 33–37.**

**Abstract:** Pipes made of high density polyethylene (HDPE) are widely applied in drinking water distribution systems and household installations. However, the organic compounds used for pipe production (especially antioxidants) may migrate from the pipe walls and thus affect the quality of tap water. This paper presents the results of laboratory tests and numerical computations visualizing the propagation of the antioxidant BHT that migrates from the HDPE pipe into the water. Our laboratory test was conducted using a closed-loop setup, where water circulated in the pipe interior with a constant flow velocity for 72 hours. BHT concentration in the water was measured by mass spectrometry, while numerical modeling was carried out using the commercial software Fluent (Ansys Inc.), supported by the input data required, and also the initial and boundary conditions. A noticeable increase was observed in the BHT content of the circulating water, which is attributable to the migration of the antioxidant from the HDPE pipe wall into the flowing water. The values obtained from numerical modeling of BHT concentration in the water were in good agreement with those measured in the laboratory setup.

**Keywords:** Tap water, HDPE pipe, antioxidant, butylated hydroxytoluene (BHT), numerical modeling, computational fluid dynamics (CFD).