LCA application in the assessment of new technologies of industrial effluents treatment

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ABSTRACT

Life cycle assessment (LCA) is a technique often used to assess the impact of technological processes on the environment and on human health. It can be also used as a tool to assess environmental micropollutants. The possibility to conduct full LCA of particular stages of technology by means of appropriate LCA software can allow for reliable identification of the sources of chemical hazards in the environment, with particular focus on the source and the amount of macro and micropollutants. Full LCA includes obtaining raw materials, production, transport, distribution, the use, maintenance, reusing, recycling and disposal. The possibility to apply LCA technique to assess i.e. chemical hazards in potential wastewater treatment with the use of new flocculants and therefore to shape the environment is presented in the study. An example of applying LCA to identify the sources and environmental impact assessment of the stage of potential production of new generation flocculants synthesised from post production polystyrene waste as well as of the stage of wastewater treatment using synthesised products is described in the study. The analysis of the impact of metallurgical waste and wastewater treatment technologies on the environment from the hard coal mine (HCM2) using sulphone derivative of polystere by different methods: Eco-indicator 99, ReCiPe and Impact 2002+ including the process of flocculent production indicated that the applied methods do not allow for comprehensive evaluation. In spite of this, it can be concluded that the factor negatively influencing the quality of the environment is mainly sulphuric acid used to obtain the flocculant. This impact is caused by the use of sulphur for its production, as well as electricity and sulphur oxides emitted into the air.

Keywords: Full life cycle assessment (LCA); New technologies; Environmental pollutants; Wastewater treatment

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