

## Enhanced COVID-19 Pharmaceuticals and Microplastics Removal from Wastewater Using Hybrid Reactor System

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**Abstract :** A unique hybrid technology was developed for the removal of COVID-19 specific contaminants from wastewater. Reactor testing was performed using model water samples contaminated with COVID-19 pharmaceuticals and microplastics. Different hydraulic retention times, concentrations of pollutants and dissolved ozone were tested. Liquid Chromatography-Mass Spectrometry, solid phase extraction, surface area and porosity, analytical tools were used to monitor the treatment efficiency and remaining sorption capacity of the spent adsorbent. The combination of advanced oxidation and adsorption processes was found to be the most effective, with the highest 90-99% and 89-95% molnupiravir and microplastics contaminants removal efficiency from the model wastewater. The research has received funding from the European Regional Development Fund (project No 13.1.1-LMT-K-718-05-0014) under a grant agreement with the Research Council of Lithuania (LMTLT), and it was funded as part of the European Union's measure in response to the COVID-19 pandemic.

**Keywords :** adsorption, hybrid reactor system, pharmaceuticals-microplastics, wastewater

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