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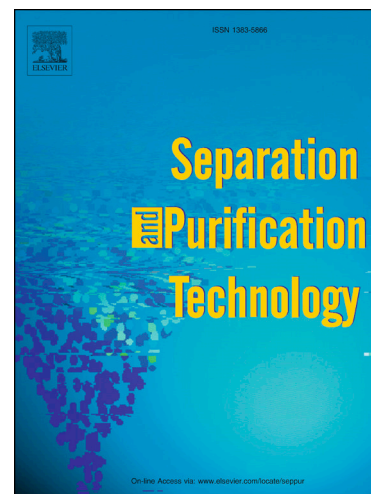
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# Regeneration and purification of water-soluble cutting fluid through ozone treatment using an air dielectric barrier discharge

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## Abstract

Cutting fluids are essential for cutting performance and rust prevention in metalworking processes. Among cutting oils, the usage of water-soluble cutting fluids is increasing rapidly because they afford excellent cooling performance and ensure fire safety. However, water-soluble cutting fluids also offer a favorable environment for the growth of a wide variety of microorganisms. The growth of microorganisms can lead to various problems such as deterioration of the cutting fluids and odor generation. Thus, technologies for purifying the waste of water-soluble cutting fluids are required. In this study, we developed an ozone treatment technology that uses an air DBD plasma system. Furthermore, sterilization experiments were performed with *K. pneumoniae*, *P. aeruginosa*, *E. coli*, and *P. vulgaris* as representative microorganisms. The system offers the advantages of low power consumption

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