



## Review

## Treatment of waters and wastewaters containing sulfur dyes: A review



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## HIGHLIGHTS

- ▶ Methods for treating waters and wastewaters containing sulfur dyes were surveyed.
- ▶ Such effluents were difficult to be fully treated by a single existing method.
- ▶ Physicochemical methods inevitably produced a large amount of harmful sludge.
- ▶ Biological methods reduced the treatment time required and enhanced COD removal.
- ▶ Combination of two bacteria with immobilization could improve biological methods.

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## ABSTRACT

Sulfur dyes are inexpensive and are used mainly for dyeing textile cellulosic materials or blends of cellulosic fibers. Sodium sulfide is fairly cheap and a traditional reducing agent used for sulfur dyeing, but it is toxic and hazardous to handle. Its use may leave harmful residues in finished fabrics and generate effluents that are difficult to treat and damaging to the environment. Textile companies face the high costs of water and wastewater, as well as strict environmental legislation. In this review, a variety of methods, including physicochemical and biological methods, are surveyed for their application to the treatment of water and wastewater containing sulfur dyes. This survey is followed by suggestions for further actions that can be taken for the improvement of the treatment processes from both economic and technical viewpoints.

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