

# Electrochemical treatment of chemical mechanical polishing wastewater: removal of fluoride — sludge characteristics — operating cost

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## Abstract

The aim of this paper is to propose an efficient and low-cost treatment of chemical mechanical polishing wastewater process based on electrocoagulation with iron bipolar electrodes. The performance of a pilot scale electrochemical reactor equipped with iron bipolar electrodes and an anode active area surface of about 170 cm<sup>2</sup> was studied. In addition, sludge settling after electrocoagulation were characterized.

The pilot study yield promising results, suggesting that further in-depth development study is worth to be considered in a future work.

**Keywords:** Electrocoagulation; CMP; Wastewater; Bipolar electrodes; Lime

## 1. Introduction

Efficient treatment of fluoride-containing wastewater efficiently has been important for environmental engineers in Algeria, following the fast development of the photovoltaic industry. An appropriate concentration of fluoride in

drinking water is required to prevent dental cavities, but long-term ingestion of water that contains more than a suitable level of fluoride causes bone disease and mottling of the teeth [1–4]. The suitable level of fluoride in drinking water specified by the World Health Organization (WHO) is 1.5 mg L<sup>-1</sup> [5]. The discharge standard of fluoride in industrial wastewater is 15 mg L<sup>-1</sup> in Algeria.

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