

DENITRIFICATION OF COAL-POWER-STATION WASTEWATERS USING LENTIKATS BIOTECHNOLOGY

DENITRIFIKACE ODPADNÍCH VOD Z TEPELNÉ ELETRÁRNY POMOCÍ BIOTECHNOLOGIE LENTIKATS

Josef Trögl 1), Olga Krhůtková 2), Věra Pilařová 1), Petra Dáňová 1), Radek Holíček 1), Jan Mrákota 2), Radek Stloukal 2), Josef Trčka 2)

1) *Jan Evangelista Purkyně University in Ústí nad Labem, Králova Výchova 3132/7, 400 96 Ústí nad Labem, Czech Republic, e-mail: josef.trogl@ujep.cz*

2) *LentiKat's a.s., Evropská 423/178, 160 00 Praha 6. Czech Republic*

Abstract:

Denitrifying bacteria encapsulated in porous polyvinyl alcohol lenses (so called Lentikats Biocatalyst) were applied for removal of N-NO_x⁻ (up to 250 mg.L⁻¹) from high salinity (up 35 g.L⁻¹ Cl⁻ and 17 g.L⁻¹ SO₄²⁻) wastewaters originating from desulphurization process within coal power stations. Laboratory batch tests revealed an inhibition of denitrification activity, which was suppressed by addition of P-PO₄³⁻. In follow-up continuous tests the denitrification activities were within the range 150-450 mg N.hr⁻¹.kg⁻¹ LB, acceptable for industrial scale applications. The higher activities were achieved under a lower salinity, higher N-NO₃⁻ influent concentration and a prolonged retention time. Effluent N-NO_x⁻ concentrations achieved in the experiment were below determination limit of 5 mg.L⁻¹. The overall results proved the applicability of Lentikats Biocatalysts for removal of nitrates from high-salinity desulphurization waters and other industrial wastewaters of similar character.

Keywords:

Lentikats Biotechnology; Polyvinylalcohol; Denitrification; Desulphurization wastewaters; High-salinity wastewaters; *Paracoccus pantotrophus*; *Pseudomonas fluorescens*