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Decolorization of azodyes using the atmospheric pressure plasma jet¹ SASA LAZOVIC, DEJAN MALETIC, NATASA TOMIC, GORDANA MAL-OVIC, Institute of Physics, University of Belgrade, Serbia, UROS CVELBAR, Jozef Stefan Institute, Ljubljana, Slovenia, ZORANA DOHCEVIC-MITROVIC, ZORAN LJ. PETROVIC, Institute of Physics, University of Belgrade, Serbia — Atmospheric pressure plasma jet operated in air/argon mixture is tested for decolorization of Bezactiv Orange V-3R dye used in the textile industry. The decolorization efficiency is determined by spectrophotometric measurements at 493.7 nm which corresponds to the breaking of dye N=N bond. The initial concentration of 50 mg/L of dye is reduced 50 times after 120 minutes of treatment by plasma. The results are compared to the efficiency of the suspended TiO_2 powder and activated by an UV lamp (300 W). The radicals responsible for removal of the dye are OH and super-anion radical. It is found that efficiency of the plasma and $TiO_2 + UV$ is quite similar for the treatment times up to 60 min. After that, TiO_2 shows higher decolorization rates (100 times reduction after 90 min). However, when plasma and TiO_2 (but without the UV lamp) are applied together, it is found that there are synergetic effects and that the efficiency is increased. Plasma (less than 2 W) is not expected to produce high amounts of UV light in the atmospheric pressure.

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