An effective Synthesis method of Microwave Solution Combustion with the application of visible light-responsive photocatalyst of Rb21 dye

Rahul Jarariya [1*], Dr. Femina Patel [2]

[1,2] Department of Chemical Engineering, Vishwakarma Government Engineering College, Chandkheda, Gujarat, India

**Corresponding author: rudrakashj47@gmail.com ; +91-9131025109*

Abstract

The textile industry uses various types of dyes and discharges a lot of highly coloured wastewater. It impacts the environment like allergic reaction, respiratory, skin problems, irritation to a mucous membrane, the upper respiratory tract has to the fore, Intoxicated dye discharges 40 to 50,000 tons with great concern. Spinel ferrites gained a lot of attention due to their wide application area from biomedical to wastewater treatment. Generally, spinel ferrite is known as M-Fe2O4. Spinel type nanoparticles possess high suspension stability. The synthesis method of Microwave solution combustion (MC) method is effective for nanoscale materials, including oxides, metals, alloys, and sulfides, works as fast and energy-efficient during the process. The review focuses on controlling, nanostructure and doping. The influence of the fuel concentration and the post-treatment temperature on the structural and magnetic properties. The effects of amounts of fuel and phase changes, particle size and shape, and magnetic properties can be characterized by various techniques. Urea is the most commonly used fuel. Ethanol or n-butanol is apt for removing impurities. As a result of the materials gives fine purity. Photocatalysis phenomena act with catalyst dosage to degrade dye from wastewater. Visible light responsive produces a large amount of hydroxyl (•OH) radical made the degradation efficiency of Rh21 type dye. It develops a narrow bandgap to make it suitable for enhanced photocatalytic activity.

Keywords: Microwave Solution Combustion method, Normal spinel, Doped Spinels, Magnetic property, Rb21.