

**ESTIMATE THE CONCENTRATION OF HEAVY METALS IN SOIL BY  
USING TRIGONOMETRIC CUBIC B-SPLINE METHOD AND ITS  
APPLICATION IN BAGHDAD**

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**Abstract**

The aims of this paper, is to estimate the concentration of heavy metals such cadmium, copper, nickel, lead, and zinc in soil by using trigonometric cubic B-spline collocation method. In this work the usual finite difference scheme is applied to discretize the time derivative. Trigonometric cubic B-spline basis functions are used as an interpolating function in the space dimension. Whereas the result is the concentration of heavy metals. This method is also suggested to estimate the concentration of heavy metals such cadmium, copper, nickel, lead, and zinc in soil of Baghdad city, Iraq. Thus we can estimate the contamination in soil by heavy metals. The result showed that the proposed method can successfully estimate the concentration of heavy metals in soil for any depth.

**Keywords:** Trigonometric cubic B-spline basis functions, Cubic trigonometric B-spline collocation method, Soil contamination, Heavy metals, Soil property.