

Past and Present Research Systems of Green Chemistry

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Gelatin wastes for better plant growth

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Gelatin, E number: 441 is an animal protein derived through acid, alkaline, or enzymatic hydrolysis of collagen extracted from hides and or skin of boiled crushed bones, connective tissue organs, chicken, pigs and horses. It has many nutritional and industrial applications, mainly in food and pharmaceutical products. The worldwide production of gelatin is about 300.000 tons per year. Gelatin is unusually high in the non-essential amino acids as glycine, proline and hydroxyproline, while lacking certain essential amino acids. During its production it releases about 10% wastes which are not hydrolysed at production temperature 60°C. The aim of this work is to use these wastes instead of being thrown away causing environmental pollution. The wastes were hydrolysed using a mixture of H₂SO₄ and H₃PO₄ acids at pH=1 thus yielding a solution of 5% of amino acids, in addition to the valuable elements S, P, Zn, Mg, Mn, Fe, and K, the latter element was introduced through neutralization with KOH to pH=6 while Zn, Mg, Fe were present in the original waste. Because of the nature of the produced solution and to ensure ease application the shelf life of the produced amino acid liquids was improved to reach one year. The completely hydrolysed product was used as a nutrient to agricultural land and exhibited 37% increase in yield crops.

Biography

Nabil Hussein El-Sayed khamis has completed his PhD at the age of 37 years from Politehnica University of Bucharest. He is the Eminent Professor at Chemistry of Tanning and Leather Technology Department. He has published more than 90 papers in reputed journals and participation of 15 scientific conferences around the world.

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