

## Hydrogels Beads of Alginate/Seaweed Powder for Plants Nutrition

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**Abstract :** Seaweed is a natural renewable resource with great potential that is not being used by the domestic industry. Here, it was used a kind of invasive algae *U. Pinnatifida* that causes serious ecological damage on the Argentinian coasts. Alginate is one of the most widely used materials for encapsulation, and has the advantage that is a natural polysaccharide derived from a marine plant. It can form thermally stable hydrogel in the presence of calcium cation. In addition, the hydrogel can be easily produced into particulate form by using simple and gentle method. The aim of this work was to obtain and to characterize novel compounds (alginate/seaweed powder) for the soil nutrition. Alginate water solutions were prepared by concentrations of 20, 30, 40 and 50 g/L, in those solutions 10g/L of seaweed powder was added. Then the dispersions were transferred from a beaker to the atomizer by a peristaltic pump (with 0.05 to 0.1 L/h flow). A tank was filled with 1 L of calcium chloride solution (4 g/L), and the solution was agitated with a magnetic stirrer. The beads were analyzed by means TGA, FTIR and swelling determinations. In addition, the improvements in the soil were qualitative measured. It was obtained beads with different diameters depend on the initial concentration and the flow used. A better dispersions of seaweed and optimal diameter for the plant nutrition applications were obtained for 40g/L concentration and 0.1 L/h flow. The beads show thermal stability and high swelling degree. It can be successfully obtained alginate beads with seaweed powder with a novelty application as plant nutrient.

**Keywords :** biodegradable, characterization, hydrogel, plant nutrition, seaweed

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