
EXPERIMENT 13 PREPARATION OF SODIUM ALGINATE

Structure

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13.1 INTRODUCTION

Alginates are produced from alginophytes (seaweeds rich in alginate). Alginates or alginic acids are various salts of alginic acid. These can be prepared by appropriate chemical treatments. A commercially important algin is sodium alginate.

Objective

After performing this experiment, you will be able to:

- prepare sodium alginate from seaweed.

13.2 EXPERIMENT

13.2.1 Principle

Seaweeds naturally contain alginates particularly calcium alginate that is insoluble in water. These are first converted to alginic acid by treating with a mineral acid. Alginic acid is also insoluble in water and is separated along with rest of the seaweed fragments as a pulp. This is treated with an alkali such as sodium carbonate to convert alginic acid to sodium alginate. This will dissolve in water. The solution is then separated and dried to obtain sodium alginate.

13.2.2 Requirements

- Dried alginophyte
- Hydrochloric acid, sodium carbonate
- Utensils
- Cloth bag, plastic bottle
- Balance
- Grinder
- Basket press
- Heater
- Drier

13.2.3 Procedure

- 1) Weigh the given dried seaweed.
- 2) Soak in water to soften and grind using a wet grinder.
- 3) Prepare a 1 N solution of hydrochloric acid by diluting concentrated acid sufficiently. Concentrated acid can be diluted about ten times with water to obtain a solution of approximately 1 N.
- 4) Heat acid to a temperature of 50°C. Add ground seaweed. Treat for a period of 30 minutes with occasional stirring.
- 5) Strain the mixture through a piece of cloth. Collect the pulp retained in the cloth.
- 6) Wash the pulp by mixing with freshwater and again strain. Transfer the pulp retained in the cloth to a vessel.
- 7) Add a solution of 3% sodium carbonate sufficient to immerse the pulp.
- 8) Allow the mixture to react for a day.
- 9) Pour the slurry into a cloth bag. Press using a basket press. Collect the liquid squeezed out.
- 10) Pour the liquid into flat bottomed trays. Dry in a tray drier at a temperature of about 50°C.
- 11) Crush the dried material to a fine powder.
- 12) Weigh the material. Pack in a plastic bottle.

13.2.4 Observations

Name of the seaweed :

Weight of dry seaweed (x) =

Weight of sodium alginate (y) =

Yield of alginate from dry seaweed = $y/x \times 100 = \dots\dots\dots\%$

13.2.5 Results

The yield of sodium alginate from dry seaweed is %

13.3 PRECAUTIONS

- Do not overheat the material.