

Absorbing Power

Applicable Product: Noveon[®]* AA-1 Polycarbophil

Scope:

This procedure demonstrates the ability of Noveon[®] AA-1 polycarbophil to absorb sodium bicarbonate solution.

Abstract:

A weighed sample of polymer is shaken with sodium bicarbonate solution. After centrifugation the supernatant is extracted. The weight of the absorbed solution is determined and the amount of solution absorbed per gram of Noveon[®] AA-1 polycarbophil is calculated.

Safety Precautions:

1. Wear safety goggles and gloves and follow good laboratory practices.
2. Polymer dust is irritating to the respiratory passages and inhalation should be avoided.
3. See Material Safety Data Sheet (MSDS) for additional safety and handling information.

Interferences:

Due to the hygroscopic nature of Noveon[®] AA-1 polycarbophil, keep the sample container tightly closed until ready to analyze. Moisture absorption from the atmosphere will influence the results.

Apparatus:

1. Vacuum oven controlled at $45 \pm 2^{\circ}\text{C}$ ($113 \pm 4^{\circ}\text{F}$) with a vacuum of 29 inches Hg.
2. Weighing bottle and stopper.
3. Analytical balance capable of ± 0.001 g accuracy.
4. Centrifuge tube, 50 ml., with closure.
5. Mechanical shaker.
6. Centrifuge capable of 2000 rpm.
7. 50 ml syringe.
8. 13 gauge needle.
9. Desiccator with silica gel desiccant.
10. Volumetric flask, 100 ml.

Reagents:

1. Sodium bicarbonate solution (see Special Instruction 1).

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Procedure:

1. Keep sample container tightly closed until ready to analyze. Do not allow sample to absorb moisture from the atmosphere. If the sample container has been exposed to the atmosphere, dry the sample in a vacuum oven controlled at $45 \pm 2^\circ\text{C}$ ($113 \pm 4^\circ\text{F}$) with a vacuum of 29 inches Hg for 4 hours. Move to a desiccator to cool to room temperature.
2. Determine the tare weight of a 50 ml centrifuge tube and closure on the analytical balance.
3. Transfer 0.05 gram of polymer, accurately weighed (Weight C) to the centrifuge tube and record the weight of the tube and sample (Weight B).
4. Add 35 ml of 1.5% sodium bicarbonate solution to the centrifuge tube.
5. Shake manually, venting as necessary to liberate carbon dioxide. Shake and vent at least 3 times.
6. Place the tight fitting closure on the centrifuge tube and shake for 60 minutes on a mechanical shaker.
7. Centrifuge at 2000 rpm for 1 hour.
8. Using a 50 ml syringe fitted with a 13 gauge needle, draw off the supernatant, being careful not to disturb the solid material. Since the addition of sodium bicarbonate followed by shaking and centrifugation is repeated, leave a minimum of supernatant rather than risk disturbing the solid material with this initial extraction.
9. Make a second addition of 35 ml sodium bicarbonate. Repeat the shaking and centrifugation steps described in steps 5-7.
10. Withdraw the supernatant. All the free water should be removed without disturbing the solid material.
11. Accurately weigh and record the tube and its contents (Weight A).
12. Calculate the weight of the absorbed solution. The absorbed weight is not less than 62 g/g of Noveon[®] AA-1 polycarbophil on a dried basis.

Calculations:

$$\text{ABSORBED WEIGHT} = (A-B)/C$$

Where A = Weight of centrifuge tube with closure and absorbed solution.

B = Weight of sample with centrifuge tube and closure before solution added.

C = Weight of sample

Special Instructions:

1. 1.5% sodium bicarbonate solution: Add 1.5 grams sodium bicarbonate (ACS reagent) to a 100 ml volumetric flask and fill to the mark with deionized water.

References:

- *Current edition of the United States Pharmacopoeia*