

**2110 Calcium Chloride Content (ASTM E449 modified)****2110.1 Sample Preparation**

1. Weigh to 0.001 g a 10 g sample deicer into a 100 ml volumetric flask.
2. Add 1 ml of 1+3 HCl, fill vol. flask to mark, and mix.
3. Pipette 10 ml sample into a 250 ml erlenmeyer flask or titrator cup depending on whether manual or automatic titration is used.
4. Add 80 ml of DI water to sample.
5. Pipette 10ml of 10% Hydroxylamine Hydrochloride solution to sample.
6. Add 3 g sucrose to sample and stir to dissolve.
7. Add 40 ml of 80g/L Sodium Hydroxide to sample and stir.
8. Add 0.4 g alpha-hydroxynaphthol blue to sample and stir.
9. Titrate according to Method A or B below.

**2110.2 Method A – Manual Titration**

1. Set up a 25 ml burette with 0.1 M EDTA solution (prepared and standardized according to ASTM E449).
2. Titrate sample to a black (gray) endpoint from the starting color of red.
3. Record volume of EDTA solution added.
4. Calculate % CaCl<sub>2</sub> according to Calculations section below.

**2110.3 Method B – Automatic Titration**

1. Setup and run titrator according to instrument manufacturer's recommendations.
2. If calculations are not performed by the instrument, calculate % CaCl<sub>2</sub> according to Calculations section below.

**2110.4 Calculations**

$$\% \text{ CaCl}_2 = \frac{\text{vol EDTA} * \text{CaCl}_2 \text{ equivalent}}{\text{sample weight} * 0.1} * 100$$