

**2109 Magnesium Chloride Content (EDTA Titration – Mn/DOT Method)****2109.1 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. Add 10 g of Ammonium Chloride to sample and stir to dissolve.
6. Pipette 10ml of 10% Hydroxylamine Hydrochloride solution to sample.
7. Add 3 g sucrose to sample and stir to dissolve.
8. Add 40 ml of concentrated Ammonium Hydroxide to sample and stir.
9. Add 4 drops of Eriochrome Black T indicator (ASTM E50) to sample and stir.
10. Titrate according to Method A or B below.

**2109.2 Test 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 %  $\text{MgCl}_2$  according to Calculations section below.

**2109.3 Test 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 %  $\text{MgCl}_2$  according to Calculations section below.

**2109.4 Calculations**

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

Note 1: Standardize EDTA solution according to ASTM E449 using standard  $\text{MgCl}_2$  solution having a  $\text{MgCl}_2$  content of 0.00714 g / ml. Prepare  $\text{MgCl}_2$  standard by weighting 15.241 g of  $\text{MgCl}_2 \cdot 6 \text{H}_2\text{O}$  in a 1000 ml volumetric flask and dilute to the mark.