

Determination of Ca, Mg and Fe Content in Inkjet Dye Paste

1 Sample solution preparation :

1.0g sample (precision to 0.0001g) was weighed and placed in a 150mL Erlenmeyer flask, then added with 10mL (9+1) mixed acid (nitric acid + perchloric acid), covered with lid and shaken, placed on a hot plate and heated for digestion. As the digestion solution becomes clear and transparent, the lid was opened and continue heated to reduce acid, until the digestion solution is about 1.0mL, then cooled down. It was transferred to a 25mL volumetric flask and the flask was rinsed 3-4 times with deionized water. Those wash solutions was combined into the volumetric flask, made up to the column and shaken. Blank reagent was prepared at the same time.

2 Experimental equipment and reagents :

AA7000 series atomic absorption spectrophotometer (with Zn, Mg, Co, Al hollow cathode lamp, EWAI Inc.)

Temperature-controlled hot plate

Nitric acid (HNO₃): excellent grade purity

Perchloric acid (HClO₄): excellent grade purity

100g/L lanthanum chloride solution: 11.73g lanthanum oxide was weighed and placed in 100mL volumetric flask, first wet with small amount of water and added with 37.5mL hydrochloric acid. Deionized water was added to dilute up to the volume.

Calcium standard solution (National Reference Materials Research Center)

Magnesium standard solution (National Reference Materials Research Center)

Iron standard solution (National Reference Materials Research Center)

3 Instrument conditions

Parameter	Wavelength (nm)	Slit width (nm)	Burner height (mm)	Fuel gas flow rate (L/min)	Lamp current (mA)	Flame type
Ca	422.7	0.2	10	1.5	3	Air – acetylene
Mg	285.2	0.2	10	1.5	2	Air – acetylene
Fe	248.3	0.2	10	1.5	3	Air - acetylene

4 Standard solution preparation

For each 100mL Ca and Mg standard solutions, 1.5 mL 100 g/L lanthanum chloride solution should be added respectively.



Element	Concentration ($\mu\text{g/mL}$)					
Ca	0	0.25	0.5	1.0	2.0	
Mg	0	0.1	0.2	0.3	0.4	
Fe	0	0.25	0.5	1.0	2.0	

5 Standard curve

When measuring Ca and Mg sample solutions, the concentration of lanthanum chloride needs to be the same as that in the standard solutions.

