

## GLI Method Summary

### **Standard Test Method for Elements in Digestates by Inductively Coupled Plasma Mass Spectrometry**

**Governing SOP:** ME-30

**Analyte:** Most Metals and Iodine

**Range:** ppb–%

#### Summary

Sample material in solution is introduced by pneumatic nebulization into radio frequency plasma where energy transfers processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially pumped vacuum interface and separated on the basis of their mass-to-charge ratio by a quadrupole mass spectrometer.

<b>Instrument</b>	<b>PerkinElmer Sciex Elan 6000, 6100, or 9000 ICP Mass Spectrometer</b>	
<b>Decomposition</b>	Variable, depends on analyte(s). Available methods include direct dissolution, open-vessel decomposition, and closed-vessel decomposition.	
<b>Calibration</b>	0.1 - 500 ppb	
<b>Sample Intro</b>	Pesticidal pump, cross flow II nebulizer, or Rytan spray chamber	
<b>Determination</b>	Quadrupole mass spectrometer	
<b>Quantitation Limit</b>	0.1 µg/L	
<b>Accuracy</b>	<u>Mean Recovery (%)</u> 98.20%	<u>Uncertainty (2<sub>s</sub>)</u> ±11.51%
<b>Interferences</b>	Isobaric interferences are addressed by selecting decomposition reagents suitable for the analysis, using alternate analysis masses (with negligible interference) or using an instrument equipped with a collision	
<b>Calculations</b>	$wt \% = (fc \times v/10 \times D)/spl$ $ppm = (fc \times v \times D)/SPL$ where <i>fc</i> = final concentration in µg/mL; <i>v</i> = sample volume in mL; <i>D</i> = dilution factor; <i>spl</i> = sample mass in mg; <i>SPL</i> = sample mass in g	

#### References

ASTM D5673 – *Standard Test Method for Elements in Water by Inductively Coupled Plasma – Mass Spectrometry.*

Tanlos, Howard E., *Inductively Coupled Plasma – Mass Spectrometry, Practices and Techniques*, 2001.

SW846 Method 6020A – *Inductively Coupled Plasma – Mass Spectrometry.*