

Total Digestion of bacterial samples for ICP-MS analysis
Version 1.0
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- 1) Before going into clean lab, make sure street shoes are covered or changed, and lab coat is on. Gloves and safety glasses should be worn at all times while working in the lab.
- 2) Dump nitric acid from clean Teflon vial into carbonate chips in sink. Rinse bottle with DI water, then wipe dry with a Kim-Wipe.
- 3) Weigh Teflon vial, and then weigh desired amount of dried bacterial sample into vial. Record weight and sample information in logbook next to balance.
- 4) Make stock of 7N HNO₃ (if necessary). To make 7N HNO₃, mix a 1:1 ratio of concentrated HNO₃ and DI water into a bottle. When mixing acidic solutions, always add acid to water. Use caution when working with concentrated HNO₃. Cap and mix well before using.
- 5) Add 5 ml of 7N HNO₃ to vial, cap, and then heat vial on hotplate set at 120°C for 6 hours.
- 6) Remove vial from hotplate and let cool for 15 minutes. Uncap vial and place on hotplate to evaporate acid to dryness.
- 7) Remove vial from hotplate and add 1 ml of 30% H₂O₂.
- 8) Heat uncapped vial on hotplate set at 120°C until dry.
- 9) If there is still visible residue after step 8, add 1 ml of 7N HNO₃ and heat at 120°C until dry. Next add 1 ml of 30% H₂O₂ and heat at 120°C until dry.
- 10) Fill vial about ½ full with internal standard solution (ISS). See “ICP-MS Solution Instructions” if ISS needs to be prepared. Re-cap, shake gently to mix sample, and place back on the hotplate for 5-10 minutes to allow sample to go back into solution.
- 11) Label and tare a clean 50 ml centrifuge tube. Pour entire contents of sample vial into tube, and rinse 3 times with ISS. Add ISS to tube up to 50 g total mass (or mass desired by analyst). Record exact mass. Mix thoroughly.
- 12) Open an ICP-MS worksheet template and enter the sample information requested. The template automatically calculates the dilution factor for each sample, which will be needed when running the samples on ICP-MS.
- 13) Label a 15 ml centrifuge tube and pour 5-10 ml of sample from 50 ml centrifuge tube into it. Sample is now ready for ICP-MS analysis!
- 14) Add 7N HNO₃ to dirty Teflon vial, cap it, and let it heat on a hotplate overnight to clean it.