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Infant formula sample preparation for element analysis using PIXE/RBS

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1 Works for me [dx.doi.org/10.17504/protocols.io.5qxg5xn](https://doi.org/10.17504/protocols.io.5qxg5xn)



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ABSTRACT

This protocol was developed to quantify chemical elements from infant formula samples by PIXE/RBS (Particle Induced X-ray Emission / Rutherford Backscattering Spectrometry). This protocol aims to analyze powdered samples. Liquid samples can also be prepared beginning from step 6.

MATERIALS

NAME	CATALOG #	VENDOR
Water Optima™ LC/MS Grade Fisher Scientific	10728098	

- 1 Work under a clean atmosphere to avoid dust contamination.
- 2 Use a disposable plastic spatula to deliver between 1.0000 grams (g) and 1.0099 g of powdered product to a laboratory-grade plastic centrifuge tube.
- 3 Add 10.00 milliliters (mL) of ultra-trace elemental analysis grade water (Water Optima™).
- 4 Vortex until the complete dissolution or uniform suspension of powder.
- 5 Store the solution or suspension at 4°C for a maximum of 24 hours.
- 6 Immediately before using, vortex the solution again.
- 7 Deliver 1.0 microliter (μL) of the solution or suspension with an air displacement pipet onto a labeled PIXE/RBS sample holder.
- 8 Repeat step 7 until a total of three different drops from the same sample are placed in three different locations of the same sample holder.



Use a different pipette tip to deliver each drop. Always vortex immediately before filling the pipette tip.

- 9 After delivering the three 1.0 μL drops onto the three different locations on the sample holder, store the sample solution or suspension at 4 °C.
- 10 DDry the drops at room temperature in a laminar flow hood for 24h.
- 11 Vortex the solution.
- 12 Superimpose onto each dried drop another 1.0 μL of solution or suspension to increase the quantity of matter in order to be more sensitive for analysis by PIXE/RBS.



Use a different pipette tip to deliver each drop. Always vortex immediately before filling the pipette tip.

- 13 Dry samples at room temperature in a laminar flow hood for 24h and store the solution or suspension at 4°C.
- 14 Repeat steps 11, 12 and 13 until each spot on the sample holder is comprised of three superimposed drops of 1.0 μL .
- 15 Store the sample holders with the dried spots in a desiccator and protect from dust until PIXE/RBS analyses.



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