

Telling pure substances from mixtures

Grade 7 science (Year 8 · Class 7) · Lab answers

These model answers use the sample class results from the table. Your measurements will differ a little, but the order of the samples should be the same. Check your calculations and conclusions against the steps below.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-PS1-2

Question 1 Rank the samples

Distilled 0.000 g, mineral 0.007 g, tap 0.012 g, salt solution 0.700 g. **Distilled, mineral, tap, salt solution.**

Question 2 Residue per litre

20 mL = 0.020 L. Tap: $0.012 \div 0.020 = 0.60$ g/L. Mineral: $0.007 \div 0.020 = 0.35$ g/L. **0.60 g/L and 0.35 g/L.**

Question 3 Check the salt solution

$35 \text{ g/L} \times 0.020 \text{ L} = 0.70 \text{ g}$, which equals the residue 0.700 g. **The prediction of 0.70 g agrees with the measurement.**

Question 4 Compare with the label

$0.35 \text{ g/L} = 350 \text{ mg/L}$. The label value is 340 mg/L, a difference of 10 mg/L, about 3 %. **The measurement agrees with the label within 3 %.**

Question 5 Which is purest?

Distilled water left no residue, so it contains almost no dissolved solids. **Distilled water.**

Question 6 Improve the method

Repeat each sample three times and take the mean; use a larger volume such as 100 mL so the residue is easier to measure; dry the glasses fully in the same way before the final weighing. **Repeat and use a larger volume.**

Question 7 Explain with particles

Water particles gain enough energy to leave as vapour, but the dissolved particles of salt are held together in the solid and do not evaporate at this temperature. **Only the water**

particles escape.