C. Weighing Out a Dispersible Sample:

There are two approaches to weighing out a sample. One approach is to first find the total weight of your sample container and its contents, pour or shake some of this material out into a labelled beaker or flask and finally reweighing the sample bottle plus remaining material. The difference between the initial and final weighing represents the sample mass. This method is called “weighing by difference.” An alternative approach is to tare the empty container on the balance, add the sample to the container, recording its mass, and then quantitatively transfer its contents to a flask or beaker. The object of this section will be to compare these two approaches.

**Weighing by Difference**

1. Weigh a clean, dry weighing bottle to the nearest 0.1mg and record the weight.

2. Fill your clean, dry weighing bottle about 1/8 full with reagent grade NaCl from the reagent shelf. Be careful not to get material on the stopper or its seat.

3. Weigh the weighing bottle with NaCl to the nearest 0.1 mg.

4. Transfer the salt to a clean, dry beaker.

5. Reweigh the weighing bottle. Compare the mass of the clean, dry weighing bottle with the mass of the weighing bottle after transferring the sample.

**Quantitative transfer**

6. Weigh a clean, dry and empty 30 or 50 mL beaker.

7. Into the beaker on the balance pan, deliver 0.250 ± 0.005 g to the nearest 0.1 mg of the NaCl. In the event that you spill NaCl onto the balance pan, clean the pan with a brush and then repeat the above steps.

RESULTS

|  |  |  |
| --- | --- | --- |
| Weighing out a Dispersive Sample |   |  |
| **Mass of clean, dry weighing bottle (g)** | 10.7047 |  |
| **Mass of weighing bottle + NaCl (g)** | 12.8634 |  |
| **Mass of weighing bottle after sample removal** | 10.7057 |  |
| **(g)** |   |  |
| **Mass of clean, dry beaker (g)** | 28.054 |  |
| **Mass of beaker + NaCl (g)** | 28.3021 |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Weighing out a Dispersive Sample |   |   |
| **Mass of NaCl transferred from weighing bottle (g)** |   | 0.0010 |
|  |   |   |
| **Mass of NaCl in beaker (g)** |   | 0.2481 |

Need the answer to the following questions based on the data above:

QUESTIONS:

1. From steps 1-5 in part C, compare the mass of the clean, dry bottle with the mass of the bottle after the sample has been removed. List possible reasons for any discrepancy. Suggest ways to test your hypotheses.

2. Explain step by step how you would prepare an aqueous solution of NaCl by dissolving 0.2500 g of NaCl in a class A 100 mL volumetric flask.

3. Calculate the molarity and error of the aqueous solution prepared in Question2. You must calculate the error using error analysis. The tolerance of the balance is ± 0.002 g. The uncertainty in the molar mass of NaCl is ± 0.0002 g/mol. You will need to determine the error in the volumetric flask by consulting Chapter 2 in the 8th edition of your textbook.

4. Describe the determinate (systematic) and indeterminate (random) errors in this experiment.

5. Why is it difficult to obtain an accurate mass of sodium hydroxide?