

CONCEPT: TYPES OF ERRORS

We've learned that all calculations made have some level of uncertainty or error associated with it.

A _____ error, also called ***indeterminate error***, occurs from uncontrollable variables in an experiment. It can occur at any time, in a positive or negative magnitude, can never be corrected and is not reproducible.

A _____ error occurs from a problem with the machinery or a design flaw in an experiment. It occurs in the same magnitude, can be corrected and is reproducible.

EXAMPLE 1: A uncalibrated pipet is used in the titration of 25 mL of 0.250 M KMnO_4 with 50.0 mL of HNO_3 . If the pipet delivers 23.120 ± 0.02 mL what can be said about the possible error(s) observed?

EXAMPLE 2: State whether the errors are random or systematic for each of the following:

a) The analytical measuring pipet in the lab consistently delivers 25.0 ± 0.03 mL.

b) I weigh an analyte sample 4 times and obtain the following numbers: 1.110, 1.392, 1.040 and 1.850.