11. Which of the following is the **strongest** acid? The K_a values are at 25 °C.

(a) H_3PO_4 $K_a = 7.1 \times 10^{-3}$
(b) HSO_4^- $K_a = 1.0 \times 10^{-2}$
(c) HSO_3^- $K_a = 6.5 \times 10^{-8}$
(d) $H_2C_2O_4$ $K_a = 5.6 \times 10^{-2}$

A group of students conducted a series of titrations to determine the concentration of acetic acid in vinegar using the following steps:

i. A sample of vinegar was pipetted into a volumetric flask that had been rinsed with the vinegar and then deionised water added up to the mark.
ii. The volumetric flask was stoppered, and the diluted solution mixed thoroughly.
iii. Aliquots of the diluted vinegar solution were pipetted into conical flasks that had been rinsed with deionised water and a few drops of indicator added to each flask.
iv. A standardised sodium hydroxide solution was added to a burette that had been rinsed with deionised water.
v. Two samples of diluted vinegar were titrated against the sodium hydroxide solution and both values were used to calculate the concentration of the vinegar.

8. Which of the following does **not** explain why Step v contributed to the errors in the titration?

There were insufficient titrations

(a) hence the sample size was too small.
(b) to determine if either was an outlier.
(c) to reduce random errors by averaging.
(d) to identify the colour change.