1. WOULD THIS PROCEDURE WORK WITH A SAMPLE OF APPLE CIDER VINEGAR? EXPLAIN WHY OR WHY NOT

Yes. Apple cider vinegar contains acetic acid. You can determine the percentage of acetic acid in apple cider vinegar using acid base titration.

1. WOULD THIS PROCEDURE WORK WITH A SAMPLE OF BALSAMIC VINEGAR? EXPLAIN WHY OR WHY NOT

No. The dark color of balsamic vinegar will make it difficult to find the end point with phenolphthalein. The color you want to find is a light pink.

1. WRITE THE FULL AND NET IONIC EQUATIONS FOR THE REACTION OF FORMIC ACID(aq) WITH NaOH(aq)

Na+(aq) + OH-(aq) + HCOOH(aq)--> HCOO-(aq) + Na-(aq) + H2O(l)

OH-(aq) + HCOOH(aq) --> HCOO-(aq) + H2O(l)

1. WHERE DOES FORMIC ACID OCCUR NATURALLY? WHY-WHAT PURPOSE DOES IT SERVE? CITE REFERENCE

This acid occurs naturally in the venom of stinging insects, especially ants. Some species of ants have ovipositors which have evolved into stingers that deliver a painful, irritating venom. Others are capable of squirting jets of liquid at aggressors from venom sacs which evolved to produce formic acid. The spray is can cause painful or debilitating burns to predators, and can leave humans with irritating welts. It’s purpose began to be used in more and more applications, playing a major role in modern agriculture and industry, including textile and leather production. In Europe, farmers apply it to livestock feed to preserve its nutritional value and kill some kinds of bacteria. Beekeepers use products containing the compound to kill mites that can infest hives. Some cleaning products also make use of formic acid, especially cleaning products used on hard surfaces, such as limescale remover and toilet bowl cleaner.

http://www.wisegeek.com/what-is-formic-acid.htm

1. WRITE THE FULL AND NET IONIC EQUATIONS FOR THE REACTION OF CITIRC ACID(aq) WITH NaOH(aq)

3Na+(aq) + 3OH-(aq) + 3H+(aq) + C3H4OH(COO)3-(aq) -->

3H2O(l) +3Na+(aq) + 3H+(aq) + C3H4OH(COO)3-(aq)

3OH-(aq) + 3H+ 🡪 3H2O(l)

1. WHERE DOES CITRIC ACID OCCUR NATURALLY? WHY-WHAT PURPOSE DOES IT SERVE? CITE REFERENCE

Citric acid is a very useful and effective preservative, obtained from naturally occurring organic acids. It exists in many different fruits and vegetables, but is especially concentrated in lemons and lime. Although it is also produced in refineries by using cane sugar, molasses, and dextrose, the citric acid stocked by Mountain Rose Herbs comes from the fermentation of crude fruit sugars. Citric acid is used extensively in the food, beverage, cosmetic, and pharmaceutical industries.

http://www.mountainroseherbs.com/learn/citric-acid.php

1. IS THE ASSUMPTION THAT THE DENSITY OF VINEGAR IS EQUIVALENT TO THAT OF WATER VALID? EXPLAIN

Vinegar is made of acetic acid and water. However, the actual amount of acetic acid in water is quite low (1~5%). Also, the density of acetic acid is not so different from the density of water (at 25 °C, the density of water is 0.9970 g/mL and the density of acetic acid is 1.049 g/mL). These things make the density of vinegar just about the same as the density of water (although it will be just slightly greater than water -- for a 5% acetic acid mixture, you can calculate a density of 0.9970 g/mL