Name:
Score: 0 / 20 points (0%)

Chapter 7 Review Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. The equivalence point is when:
a. there are equal number of moles of each reactant.
b. the reactants are all used up.
c. the limiting reactant is used up.
d. the molar ratio of reactants is the same as in the balanced equation.

ANSWER: D
Equivalence point is reached when the reactants are present in the mole ratio given by the balanced equation for the reaction being investigated.
POINTS: 0 / 1
FEEDBACK:
REF: 190

___ 2. Reading a measuring cylinder when the meniscus is at eye level:
a. increases reliability.
b. reduces validity.
c. reduces parallax error.
d. increases the volume.

ANSWER: C
Reading a measurement at eye level reduces parallax error and increases accuracy.
POINTS: 0 / 1
FEEDBACK:
REF: 191

___ 3. The point in a titration when the colour change occurs is called the:
a. starting point.
b. equivalence point.
c. mid-point.
d. end point.

ANSWER: D
The end point is identified when an indicator colour change occurs and is the physical sign that the equivalence point has been reached.
POINTS: 0 / 1
FEEDBACK:
REF: 191

___ 4. Which of the following statements regarding the rinsing of apparatus is correct?
a. The burette is rinsed with distilled water.
b. The pipette is rinsed with distilled water.
c. The volumetric flask is rinsed with distilled water.
d. The burette does not need to be rinsed.

ANSWER: C
The burette and pipette should be rinsed with the solution being used in that apparatus. The volumetric flask is used to make accurate concentrations so

should be rinsed with distilled water.
POINTS: 0 / 1
FEEDBACK:
REF: 192

___ 5. Acid–base indicators are made of:
a. a weak acid.
b. a strong base.
c. a neutral substance.
d. a strong acid.

ANSWER: A
An acid–base indicator contains a weak acid where the acid has a different colour to its conjugate base.
POINTS: 0 / 1
FEEDBACK:
REF: 194

___ 6. A primary standard is:
a. a chemical that can be made into a solution of a known concentration.
b. a chemical that can make a solution.
c. a chemical that is insoluble.
d. an acid solution of known concentration.

ANSWER: A
A primary standard is used to accurately determine the concentration of an unknown solution so must be a solution of accurately known concentration.
POINTS: 0 / 1
FEEDBACK:
REF: 196

___ 7. Which of the following is *not* a characteristic of a primary standard?
a. High purity
b. Stable in air
c. Large molar mass
d. Absorbs water

ANSWER: D
The mass of a primary standard must be accurate, so it should not absorb water.
POINTS: 0 / 1
FEEDBACK:
REF: 195–6

___ 8. The solution in the burette is called the:
a. burant.
b. analyte.
c. titrant.
d. filtrate.

ANSWER: C
The solution in the burette is the titrant and the solution to be analysed is the analyte.
POINTS: 0 / 1
FEEDBACK:
REF: 198

___ 9. The best indicator for an acid-base reaction depends on:
a. the base.
b. the salt produced.

c. the acid.
d. the concentration of the primary standard.

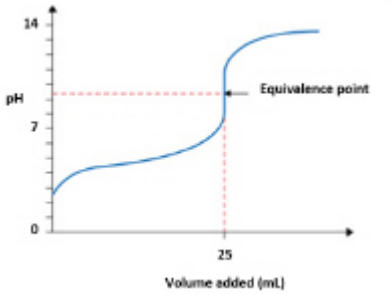
ANSWER: B
The pH of the final solution may be acidic, neutral or basic depending on the salt produced, so the indicator must be chosen to change colour at an endpoint matching the pH of the final solution.
POINTS: 0 / 1
FEEDBACK:
REF: 200

___ 10. The end point for a reaction between a strong acid and a weak base would most likely be:
a. acidic.
b. neutral.
c. basic.
d. none of the above.

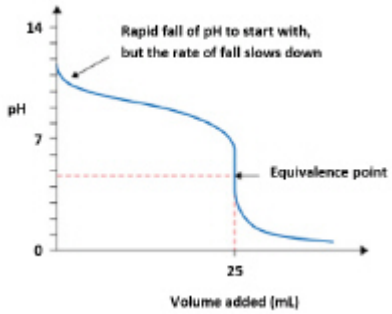
ANSWER: A
The reaction of a strong acid and weak base produces an acidic salt.
POINTS: 0 / 1
FEEDBACK:
REF: 200

___ 11. Which of the following titration curves would be appropriate for a titration where hydrochloric acid is added from the burette to a solution of ammonia?

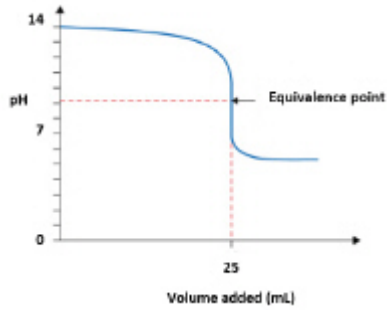
A



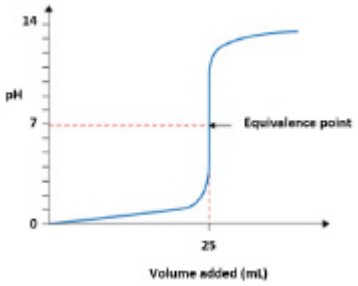
B



C



D



a. A
b. B
c. C
d. D

ANSWER: B
Ammonia is a weak base so solution will initially be basic and adding a strong acid will produce an acidic salt, so the equivalence point will fall at a pH < 7.
POINTS: 0 / 1
FEEDBACK:
REF: 203

___ 12. Weak acid/weak base titrations are generally not performed because:
a. they are not needed.
b. there is no sudden change in pH at the equivalence point and therefore it is hard to identify the equivalence point.
c. the indicators do not work in weak acid/weak base reactions.
d. the pH changes too quickly at the equivalence point, so it is easily missed.

ANSWER: B
The titration curve for a weak acid and weak base does not show significant change in pH to equivalence point cannot be easily identified.
POINTS: 0 / 1
FEEDBACK:
REF: 204

___ 13. A back titration is often used to determine the percentage of calcium carbonate in limestone. In this process:
a. the limestone is dissolved in distilled water.
b. the calcium carbonate reacts with excess base.
c. the calcium carbonate reacts with excess acid.
d. an indicator is used to determine the pH of the calcium carbonate.

ANSWER: C
Calcium carbonate is reacted with a known volume and concentration of acid, producing a salt, water and carbon dioxide. The amount of unreacted acid is then determined by titration.
POINTS: 0 / 1
FEEDBACK:
REF: 208

___ 14. If potassium permanganate was added to a colourless solution in a redox titration the colour change at the end point would be:
a. colourless to pale purple.
b. deep purple to pale pink.
c. colourless to deep purple.
d. deep purple to colourless.

ANSWER: B

MnO_4^- is a purple colour and is reduced to pale pink Mn^{2+}.

POINTS: 0 / 1
FEEDBACK:
REF: 214

___ 15. A redox titration would *not* be suitable for determining:
a. the concentration of Vitamin C in oranges.
b. the concentration of sulfur dioxide in wine.
c. the concentration of hydrogen peroxide in toothpaste
d. the concentration of ammonia in cleaning products.

ANSWER: D
Ammonia is a base so would be analysed using an acid-base titration.
POINTS: 0 / 1
FEEDBACK:
REF: 214

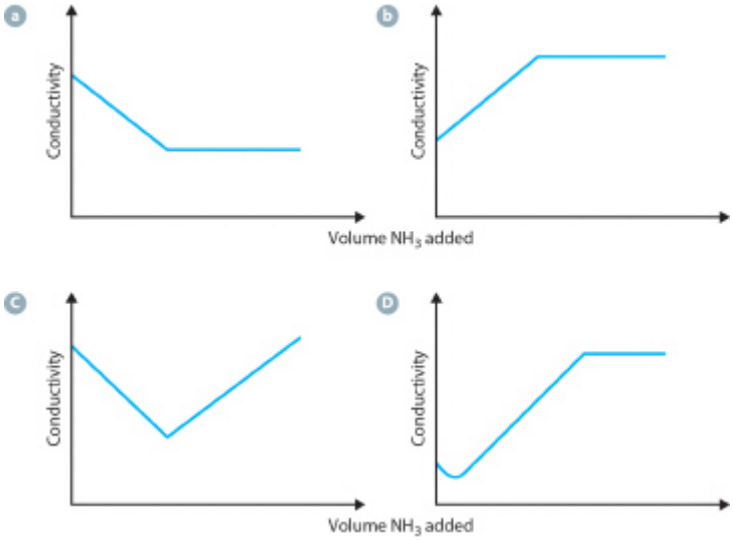
___ 16. What indicator changes colour in the range of pH 6.2–7.6?
a. phenolphthalein
b. methyl red
c. methyl orange
d. bromothymol blue

ANSWER: D
Different indicators change colour at different pH ranges.
POINTS: 0 / 1
FEEDBACK:
REF: 194

___ 17. 50 mL of a 0.06 mol L^{-1} solution of NaOH was needed to neutralise 60 mL of a HCl solution. What is the concentration of the HCl solution?
a. 0.03 mol L^{-1}
b. 0.05 mol L^{-1}
c. 0.06 mol L^{-1}
d. 0.10 mol L^{-1}

ANSWER: B
Moles NaOH = 3×10^{-3} = moles HCl, [HCl] = 3 x 10^{-3}/0.06 = 0.05 mol L^{-1}
POINTS: 0 / 1
FEEDBACK:
REF: 198

___ 18. The electrical conductivity of a mixture is measured as a solution of NH_3 is added to a solution of HCl. Which of the graphs below correctly show the conductivity changes that occur?



a. a
b. b
c. c
d. d

ANSWER: A
As the acid is added the conductivity decreases as the highly mobile H^+ ions are replaced by the less mobile NH_4^+ ions until equivalence point. Further addition of the NH_3 does not lead to an increase in conductivity.
POINTS: 0 / 1
FEEDBACK:
REF: 207

___ 19. Buffer solutions are important for animals and plants in the environment because they protect against sharp changes in pH. A buffer solution is usually composed of a mixture of:
a. strong acid and strong base.
b. weak acid and weak base.
c. strong acid and weak base.
d. weak acid and strong base.

ANSWER: B
The equilibrium established by a weak acid and its conjugate weak base will shift to counteract the addition of another acid or base.
POINTS: 0 / 1
FEEDBACK:
REF: 221

___ 20. Which of the following pairs would be the lease effective as a buffer?
a. HPO_4^{2-} and $H_2PO_4^-$
b. CO_2 and HCO_3^-
c. CH_3COOH and CH_3COO^-
d. HNO_3 and NO_3^-

ANSWER: D
A buffer is composed of a weak acid and its conjugate base (or vice versa). HNO_3 is a strong base and NO_3^- forms a neutral salt.
POINTS: 0 / 1
FEEDBACK:
REF: 221–2


Retake