

Progress Test 3

In the periodic table, Oxygen belongs to the sixth group and to the second period, therefore:

- it has a total of 6 electrons
- it has 6 electrons in the last shell
- it has 2 electrons in the last shell
- it has 6 electronic levels

Ethanol and dimethyl-ether are an example of which type of isomerism?

- Optical isomerism
- cis-trans* isomerism
- positional isomerism
- functional group isomerism

Which of the following formulas would you use to calculate the equilibrium constant of the following homogeneous reactions? $2\text{N}_2\text{O}_5 \rightleftharpoons 2\text{N}_2 + 5\text{O}_2$

- $K_c = [\text{N}_2\text{O}_5]^2 / [\text{N}_2]^2 [\text{O}_2]^5$
- $K_c = [\text{N}_2]^2 [\text{O}_2]^5 / [\text{N}_2\text{O}_5]^2$
- $K_c = [\text{N}_2\text{O}_5] / [\text{N}_2] [\text{O}_2]$
- $K_c = [\text{N}_2]^5 [\text{O}_2]^2 / [\text{N}_2\text{O}_5]^2$

Which of the following compounds has an acidic behaviour in water?

- sodium nitrate
- ammonium chloride
- sodium hydrogen carbonate
- potassium sulphate

What does a rod of metal submerged in an aqueous solution of its ion represent?

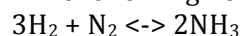
- a difference in electric potential
- a buffer
- a voltaic cell
- half of a galvanic cell

Write the formulas of the following compounds

2,2-dimethylpropane; phosphoric acid; 2-propyl ammine; boric acid

-Calculate the osmotic pressure of an aqueous solution containing 0.7 g of glucose and 1 g of potassium sulphate in 500 ml of water at 25°C.

- The following homogeneous gaseous reaction takes place at 900K:



Determine the numerical value of the equilibrium constant and its units of measurement, knowing that after having mixed 2.7 mol of molecular Hydrogen and 0.9 mol of molecular nitrogen in a volume of 5 L, at equilibrium there are 2.1 mol of molecular Hydrogen.

-1 g of sodium methanoate is added to 500 ml of methanoic acid 0.05 M. Which is the final pH? ($K_a = 2 \cdot 10^{-4}$ M).

-Calculate the pH of a solution of ammonia prepared by diluting 5 ml of the commercial solution (30%w, $d=0.9$ g/ml) in 500 ml of water. (Ignore the variation of volume; $K_b = 1.8 \cdot 10^{-5}$ M).