Answer on Question #82656 – Chemistry – General Chemistry

Given the stoichiometry of the reaction and the amount of MnO_4^- consumed in the reaction, how many moles of H_2O_2 were present in the old solution? Choose the closest answer

a) 0.00651 mol

b) 6.51 mol

c) 0.0316 mol

d) 0.126 mol

Solution:

$2KMnO_4 + 5H_2O_2 + 3H_2SO_4 \rightarrow K_2SO_4 + 2MnSO_4 + 8H_2O + 5O_2$

For the second titration with the old H_2O_2

$n(MnO_4^-) = C \times V = 0.2\ mol/L \times 0.01268\ L = 2.54 \times 10^{-3}\ mol$

Based on the ratio that 2 molecules of permanganate neutralise 5 molecules of H_2O_2, the number of moles of H_2O_2 (that were neutralized) is $5/2 \times$ the number of moles of permangante

$n\ (MnO_4^-) = 2\ mol$; $n\ (H_2O_2) = 5\ mol$

$n\ (MnO_4^-) = 2.54 \times 10^{-3}\ mol$, $n\ (H_2O_2) = 6.35 \times 10^{-3}\ mol$

Answer: a) 0.00651 mol