Answer on Question#62393 - Chemistry - General Chemistry

A fertilizer railroad car carrying 32400 gallons of commercial aqueous ammonia (30% ammonia by mass) tips over and spills. The density of the aqueous ammonia solution is 0.88 g/cm3.

1)What mass of citric acid, C(OH)(COOH)(CH2COOH)2, (which contains three acidic protons) is required to neutralize the spill? 1 gallon = 3.785 L.

Answer:

First we should calculate the mass of the aqueous ammonia solution.

32400×3.785 = 122634l 122634×0.88=107918g

mass of the non aqueous ammonia - 107918×0.3=32375g = 1904mol

Mass of the citric acid required for the neutralization of the ammonia can be calculated from the molecular equation:

$C_6H_8O_7 + 2NH_3 \rightarrow (NH_4)_2C_6H_6O_7$

192 g 34g

xg 32375g

x= 182823g