Lafayette College

Department of Civil and Environmental Engineering

CE 321: Introduction to Environmental Engineering and Science Fall 2019

Homework #5

### Due: Wednesday, 10/2/19

1. Calculate the following molarity and normality of the following:
   1. 200.0 mg/L HCl
   2. 150.0 mg/L H2SO4
   3. 100.0 mg/L Ca(HCO3)2
   4. 70.0 mg/L H3PO4 (Assume it dissociates completely, just as a strong acid)

1. Calculate the following molarity and normality of the following:
   1. 80 µg/L HNO3
   2. 135 µg/L CaCO3
   3. 10 µg/L Cr(OH)3
   4. 1000 µg/L Ca(OH)2
2. Calculate the mg/L of the following:
   1. 0.2500 M NaOH
   2. 0.0010 M Na2SO4
   3. 0.0340 M K2Cr2O7
   4. 0.1342 M KCl
3. Calculate the µg/L of the following:
   1. 0.0500 N H2CO3 (Assume it dissociates completely, just as a strong acid)
   2. 0.0010 M CHCl3 (treat as an organic that does not dissociate)
   3. 0.0300 N Ca(OH)2
   4. 0.0080 N CO32-
4. Convert the following from mg/L as the ion to CaCO3:
   1. 83.00 mg/L Ca2+
   2. 27.00 mg/L Mg2+
   3. 48.00 mg/L CO2
   4. 220.00 mg/L HCO3-
   5. 15.00 mg/L CO32-
5. Convert the following from mg/L as CaCO3 to mg/L as the ion or compound requested below:
   1. 10.00 mg/L CO2
   2. 13.5 mg/L Ca(OH)2
   3. 481.00 mg/L H3PO4 (Assume it dissociates completely, just as a strong acid)
   4. 81.00 mg/L H2PO4- (treat as an anion)
   5. 40.00 mg/L Cl-
6. Convert 0.0100 N Ca2+ to mg/L as CaCO3