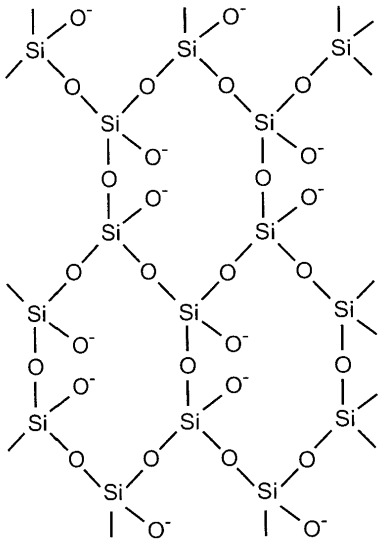
Year 12 Chemistry Silicates Assignment NAME_____

1. Write the formula of the anion for each silicate or aluminosilicate below:
   (a) K_2SiO_3
   (b) $CrAl_3(Si_3O_8)_3$
   (c) $NaAlSiO_4.7H_2O$ /3

2. Calculate the value of *x* in each silicate or aluminosilicate below:
   (a) $KAl_5Si_7O_x(OH)_4$
   (b) $Mg_x(OH)_2(Si_2O_5)_2$ /2

3. Consider the structure below:

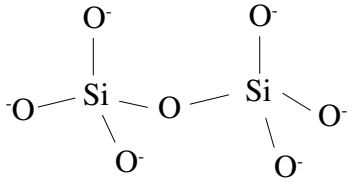


   (a) Circle a SiO_4 structural unit in the diagram. /1
   (b) Identify the repeating unit in the structure. /1
   (c) Write the formula of the anion. /1

4. State the charge on a silicate anion if the Si:O ratio is:
   (a) 4:11
   (b) 3:7
   (c) 1:4 /3

5. Describe the structural unit all silicates have in common. /2

6. Write the formula of a silicate mineral if the structural formula of the anion is as shown below and the metal ions present are sodium and potassium in a 1:1 mole ratio.



/2

7. State the charge of an aluminosilicate ion with formula $AlSi_2O_9^{x-}$ /1

8.
   (a) With an example equation, explain the effect on the concentration of cations in the soil if a plant in the soil absorbs cations. /3
   (b) Explain the effect of acid rain on the amount of cations in the soil available to plants. /2

9. Explain the use of aluminium ions in flocculating clay particles suspended in water. /3

10.
   (a) Describe what a zeolite is. /2
   (b) Explain how a zeolite is able to soften water. /2

TOTAL /28