

Uva Wellassa University of Sri Lanka
Faculty of Applied Sciences
Department of Science and Technology
4th Year 1st Semester Examination – July/August 2019



MRT 477-1 Simulation of Fluid-Rock Interaction Systems

0016

This is a practical examination
Number of questions: Two (02)
Answer all questions
Time allocation: Two (02) hours
Mark allocation: 100

Index No.

Questions are based on simulations using PHREEQC computer program
All required files and additional instructions are available in the UWU-VLE
Create a working folder named "MRT15-*your number*" (e.g. MRT15-064)
Your input files should be named in the format "MRT15-*your number*-Q1a" etc. (e.g. MRT15-064-Q2b)

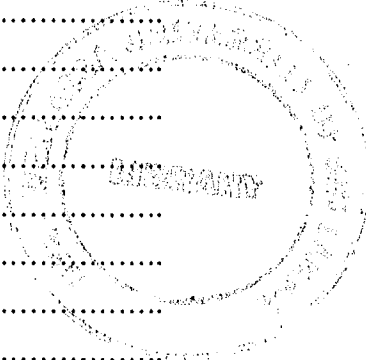
Q1.

Given below is an analysis of spring water from two different geologic units. Concentrations are given in mmol/L.

| Geologic Unit | pH | Temp °C | Na | K | Mg | Ca | Si | Cl | HCO ₃ ⁻ Alk. | SO ₄ ²⁻ |
|-------------------|------|------------|------|-------|------|------|------|------|---------------------------------------|-------------------------------|
| Calcareous Schist | 8.12 | 25 | 0.04 | 0.011 | 0.31 | 0.94 | 0.05 | 0.05 | 2.23 | 0.15 |
| Mica Schist | 7.63 | 25 | 0.04 | 0.016 | 0.11 | 0.17 | 0.05 | 0.05 | 0.37 | 0.08 |

- (a) Perform an equilibrium speciation calculation of the two water samples. (i) Giving reasons comment on the quality of the above laboratory analysis. (ii) Briefly describe mineral equilibrium conditions that you observe in these two systems.

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(15 marks)

7.6

