Name Date

Worksheet 20.2: Practical on setting up voltaic cells and measuring voltages

(TR material subchapter 20.4, main teaching ideas, activity 2)

Analysis of results

**1** Record your observations from the experiment, including those which could be evaluated as sources of errors.

**2** Record the raw quantitative data in a table. You need to include their units and absolute uncertainties where appropriate.

**3** Write the full chemical and ionic equations for reactions occurring in each cell made.

**4** Draw the cell diagram for the Mg|MgSO4||CuSO4|Cu cell. On your diagram, mark the negative electrode and the direction of electron flow in the external circuit.

**5** State the function of the salt bridge.

**6** Arrange the metals in order of their reactivities (how strong they are as reducing agents) and the metal salts in order of their strengths as oxidising agents.

Evaluation of experiment

**7** Using the IB Chemistry data booklet, calculate the expected cell potentials for each combination of the voltaic cells you made.

**8** Calculate the percentage errors in the cell potentials for each cell combination you made.

**9** Explain why a high-resistance voltmeter (a potentiometer) should be used to measure the cell potential in your experiment.

**10** Describe the key features of a standard hydrogen electrode.

**11** Describe three systematic errors in your experiment.

**12** Suggest improvements for each systematic error mentioned in Question 11.