

April 10, 2002

➤ **This Week:** *Demo a day continues!*

➤ **Redox:** Readings and Assigned Problems (with solutions) are now online!

➤ **Exam #3**

✓ 1999 Exam #3 Questions now online

✓ Exam Info Page now online

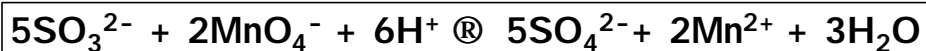
✓ **Sunday, 4/14 Review Session: 4:30 - 6:00 pm, B203 Angell**

✓ Email me *this week* if you need to take exam at an alternate time

1

Example: Simplify and Verify

Collecting and cancelling gives:



Verify!

✓ Mass Balance

✓ Charge Balance

Done!

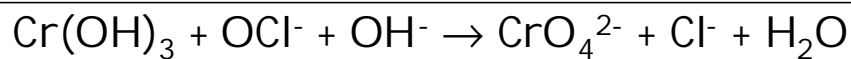
2

In Basic Solution?

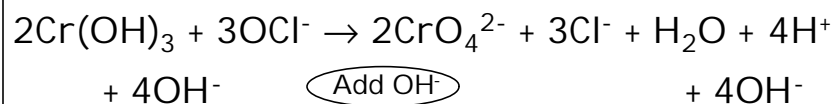
- **First:** Balance as though in acid
- **Next:**
 - ✓ Add OH^- to both sides of reaction in an amount equal to the amount of H^+
 - ✓ *Change:* $\text{H}^+ + \text{OH}^-$ to H_2O
 - ✓ Verify!

3

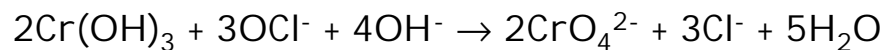
Example (Basic Solution)



↓ In Acid Solution



↓ Make Water



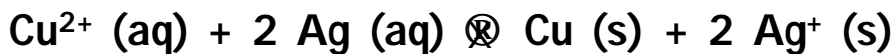
4

Back to Cu/Ag Reaction

How can we *predict* reaction spontaneity?



versus

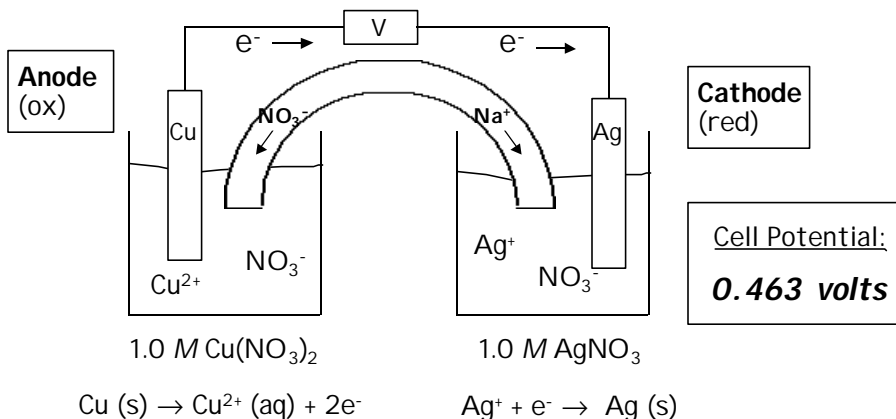


$\Delta G?$ $K?$ Direction/Extent of Reaction?

5

The Galvanic Cell

➤ Set up, literally, two half-cells for the reaction:



6

Electromotive Force

➤ What is the Cell Potential?

- Recall: 1 Joule = 1 volt x 1 coulomb
(work) (potential) (charge)
- *Driving Force* of reaction
- The *Electromotive Force* (EMF)
- E°_{cell} (all species in standard states)

Galvanic Cell shorthand:



$$E^{\circ}_{\text{cell}} = 0.463 \text{ volts}$$

Anode
(oxidation)

Cathode
(reduction)

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