B7 · Extra practice

Original diploma-style practice | Items 1-2

Extra practice for this lesson. Original questions, not released diploma items. Select one option for multiple choice; other tasks state the required response.

Use the givens and conditions in each prompt. Enter the requested count, coefficient, oxidation number or potential with the stated unit and precision.

B7-D01 · Numerical response

A lead half-cell is joined to the standard hydrogen half-cell and reads 0.13 V. Electrons flow from the lead toward the hydrogen half-cell. What is E° for $Pb^{2+} + 2e^- \rightarrow Pb$, in volts to two decimal places?

Response: _____

B7-D02 · Multiple choice

Which of these is the strongest oxidizing agent, given Cl_2/Cl^- +1.36 V, Br_2/Br^- +1.07 V and I_2/I^- +0.54 V?

A. I_2
B. Br_2
C. Cl_2
D. I^-

Response: _____

B7 · Extra practice

Original diploma-style practice | Items 3-4

B7-D03 · Numerical response

For a cell in which Br_2 is reduced and I^- is oxidized (Br_2/Br^- +1.07 V; I_2/I^- +0.54 V), what is E°cell in volts to two decimal places?

Response: _____

B7-D04 · Multiple choice

Why does the Fe^{3+}/Fe^{2+} half-cell need an inert electrode?

A. Iron metal is too expensive
B. There is no solid metal in the half-cell to carry electrons
C. Fe^{3+} is a solid
D. Inert electrodes make the voltage larger

Response: _____

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Original diploma-style practice | Items 5-6

B7-D05 · Select all that apply

Select every correct statement about reading the table of table values.

A. Every row is written as a reduction
B. A higher value means a stronger oxidizing agent on the left of the row
C. The sign of a value is reversed when that half is oxidized
D. The lowest row has the strongest reducing agent on the right

Response: _____

B7-D06 · Numerical response

A cell has Fe^{3+}/Fe^{2+} (+0.77 V) as the cathode and Zn^{2+}/Zn (−0.76 V) as the anode. What is E°cell in volts to two decimal places?

Response: _____

B7 · Extra practice

Original diploma-style practice | Items 7-8

B7-D07 · Ordering / ranking

Arrange the steps for building a cell from two rows of the table.

First to last

1. Calculate E°cell = E°cathode − E°anode
2. Match the electrons and add the halves
3. Choose the higher value as the cathode
4. Write the reduction and the oxidation

Response: _____

B7-D08 · Matching

Match each item in the MnO_4^- / Fe^{2+} cell to its role.

Items to match:

1. MnO_4^-
2. Fe^{2+}
3. Carbon electrode
4. Comma in the notation

Targets:

A. Oxidized at the anode
B. Separates ions in the same solution
C. Carries electrons only
D. Reduced at the cathode

Response: _____

B7 · Extra practice

Original diploma-style practice | Items 9-10

B7-D09 · Numerical response

In $MnO_4^- + 8H^+ + 5Fe^{2+} \rightarrow Mn^{2+} + 4H_2O + __Fe^{3+}$, what coefficient of Fe^{3+} balances the equation? Enter an integer.

Response: _____

B7-D10 · Multiple choice

A calculation gives $E°_{cell} = -0.30$ V for a written reaction. Which statement is correct?

A. The reaction cannot happen under any conditions
B. The written direction is not spontaneous under standard conditions
C. The reaction is very fast
D. The reaction has no electrons transferred

Response: _____

B7 · Extra practice

Original diploma-style practice | Items 11-12

B7-D11 · Multiple choice

In the cell C(s) | $Fe^{2+}(aq)$, $Fe^{3+}(aq)$ || $MnO_4^-(aq)$, $H^+(aq)$, $Mn^{2+}(aq)$ | C(s), what happens to the pH near the cathode?

A. It falls
B. It rises
C. It does not change
D. It becomes zero

Response: _____

B7-D12 · Written response

A student says a positive E°cell proves that a reaction will happen quickly. Explain what is wrong.

Response: _____