

Lecture 29 CH102 A1 (MWF 9 am) Spring 2017 Copyright © 2017 Dan Dill dan@bu.edu

**[TP]** What is true about the process  
 $\text{Cl}^-(1 \text{ M}) \rightarrow \text{Cl}^-(0.0001 \text{ M})$ ?

25% 1.  $E^\circ > 0$   
 25% 2.  $E^\circ = 0$   
 25% 3.  $E^\circ < 0$   
 25% 4. More information needed

BOSTON UNIVERSITY Response Counter 10 1

Lecture 29 CH102 A1 (MWF 9:05 am)  
 Friday, April 7, 2017

- Complete: Concentration cells: Mixing  $\rightarrow$  electric current

Next lecture: Begin ch17: Spontaneous change: How far?

Notes: Spontaneity: Second law of thermodynamics  
<http://quantum.bu.edu/courses/ch102-spring-2017/handouts.html>

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**[TP]** The process  
 $\text{Cl}^-(1 \text{ M}) \rightleftharpoons \text{Cl}^-(0.0001 \text{ M})$   
 is spontaneous. The correct cell line notation is ...

20% 1.  $\text{Pt(s)} \mid \text{Cl}^-(0.0001 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \parallel \text{Cl}^-(1 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \mid \text{Pt(s)}$   
 20% 2.  $\text{Pt(s)} \mid \text{Cl}^-(0.0001 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \parallel \text{Cl}_2(1 \text{ bar}) \mid \text{Cl}^-(1 \text{ M}) \mid \text{Pt(s)}$   
 20% 3.  $\text{Pt(s)} \mid \text{Cl}^-(1 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \parallel \text{Cl}^-(0.0001 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \mid \text{Pt(s)}$   
 20% 4.  $\text{Pt(s)} \mid \text{Cl}^-(1 \text{ M}) \mid \text{Cl}_2(1 \text{ bar}) \parallel \text{Cl}_2(1 \text{ bar}) \mid \text{Cl}^-(0.0001 \text{ M}) \mid \text{Pt(s)}$   
 20% 5. None of the above

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## Concentration cell construction

A concentration cell is constructed with  $Q$  corresponding to the  $\text{Cl}^-$  concentration difference between sea water and river water at 25 °C. Assume that the  $\text{Cl}^-$  concentration (due to dissolved NaCl) of sea water is 35 g/L and than that of river water is 1.0 mg/L.



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**[Group Quiz]** A concentration cell is constructed with  $Q$  corresponding to the  $\text{Cl}^-$  concentration difference between sea water and river water at 25 °C. Assume that the  $\text{Cl}^-$  concentration (due to dissolved NaCl) of sea water is 35 g/L and than that of river water is 1.0 mg/L. The voltage of this cell is ...

- 20% 1.  $E = +0.13 \text{ V}$
- 20% 2.  $E = +0.27 \text{ V}$
- 20% 3.  $E = +0.54 \text{ V}$
- 20% 4.  $E = +1.08 \text{ V}$
- 20% 5. Something else

Response  
Counter

10

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