Water Quality Testing and Treatment (New Engine)
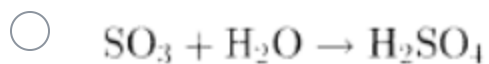
🧮   ☐ Calculator

4. A water analysis of lake water has the results shown, with all values reported as $CaCO_3$.

alkalinity	151.5 mg/L
sodium	120.0 mg/L
calcium	127.5 mg/L
iron (III)	0.107 mg/L
magnesium	43.5 mg/L
potassium	8.24 mg/L
chloride	39.5 mg/L
fluoride	1.05 mg/L
nitrate	1.06 mg/L
sulfate	106 mg/L

The water's hardness is most nearly

- ○ 170 mg/L
- ○ 290 mg/L
- ○ 150 mg/L
- ○ 300 mg/L

Multiple Choice   1 point

4. Which of the following equations represents the formation of acid rain?

(A) $S + O_3 + H_2O \rightarrow H_2SO_4$

(B) $SO + O_2 + H_2O \rightarrow H_2SO_4$

(C) $SO_2 + H_2O \rightarrow H_2SO_3$

(D) $SO_3 + H_2O \rightarrow H_2SO_4$

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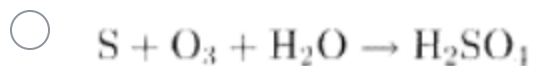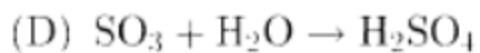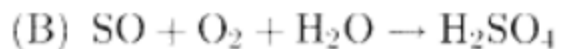
Multiple Choice   1 point

10. Which of the following are generally true for water treatment relative to the adsorption of a contaminate by activated carbon?

I.   The adsorption is a chemical reaction and typically irreversible.

II.   The adsorption is a physical reaction (van der Waals forces) and generally reversible.

III.   Water soluble, inorganic contaminants with low molecular weights are best adsorbed by activated carbon.

IV.   The contaminant sticks to the surface of the activated carbon particles.

○   II and IV

○   I, II, III, and IV

○   III and IV

○   I, II, and III

Multiple Choice   1 point

▦ ☐ Calculator

A municipal wastewater treatment plant is processing a waste flow with a 5-day BOD of 200 mg/L at 20°C. If the BOD rate constant k_1 (base e) at 20°C is 0.23 day^{-1}, the ultimate BOD (mg/L) of the raw wastewater at 20°C is most nearly:

○   292

○   233

○   133

○   420