

Clicker Questions for *Concentration*

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COURSE:

Introductory / Preparatory College Chemistry

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Which action(s) will **increase** the concentration of the solution?

- ① Add more $\text{Co}(\text{NO}_3)_2$
- ② Evaporate water
- ③ Drain solution

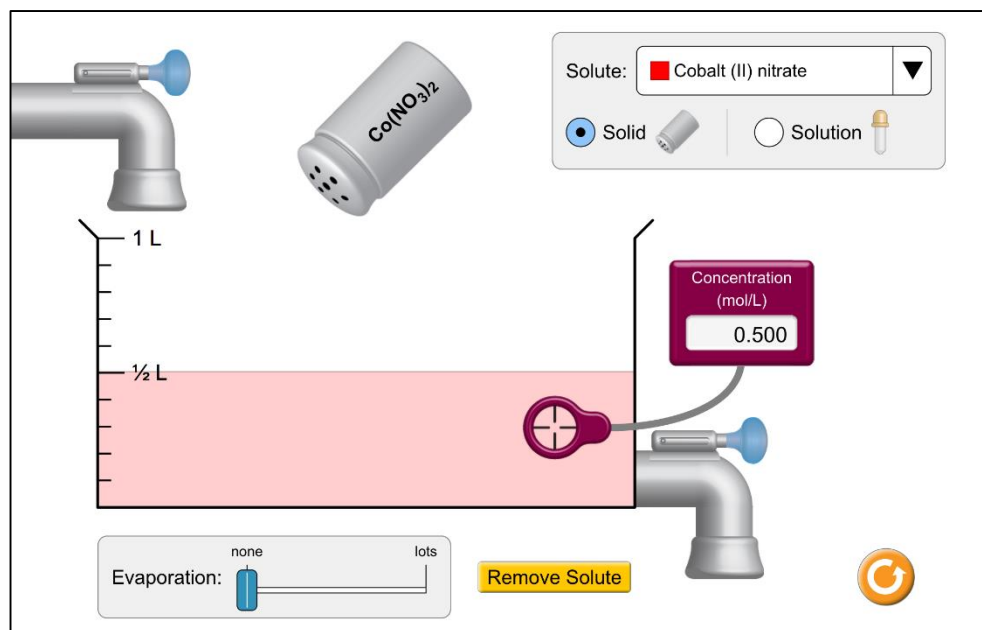
A. (1) only

B. (1) and (2)

C. (2) and (3)

D. (1) and (3)

E. (1), (2), and (3)



Which action(s) will change the number of moles of solute in the container?

- ① Add water
- ② Evaporate water
- ③ Drain solution

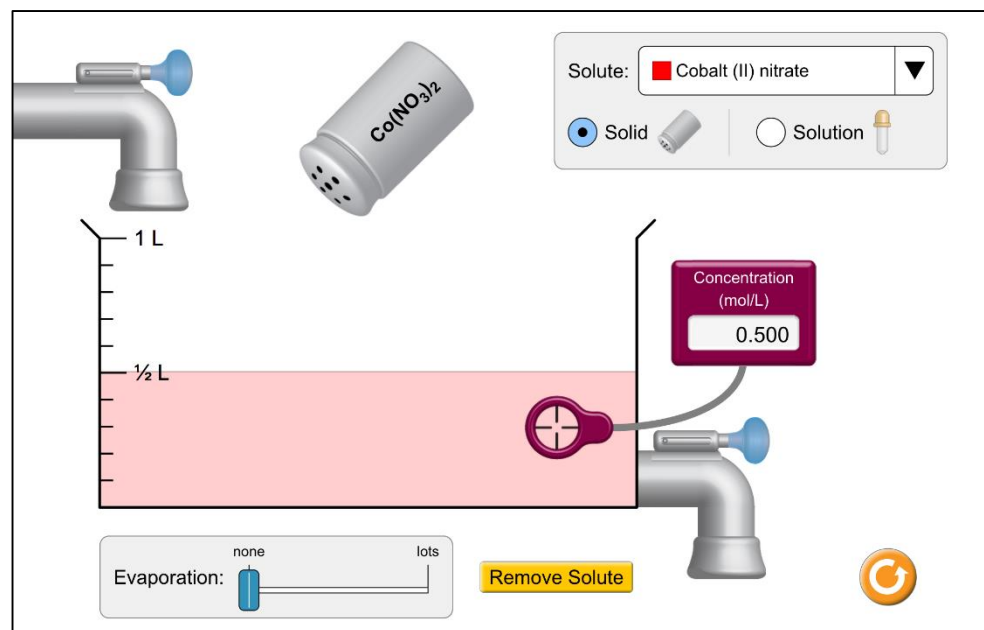
A. (1) only

B. (2) only

C. (3) only

D. (1) and (2)

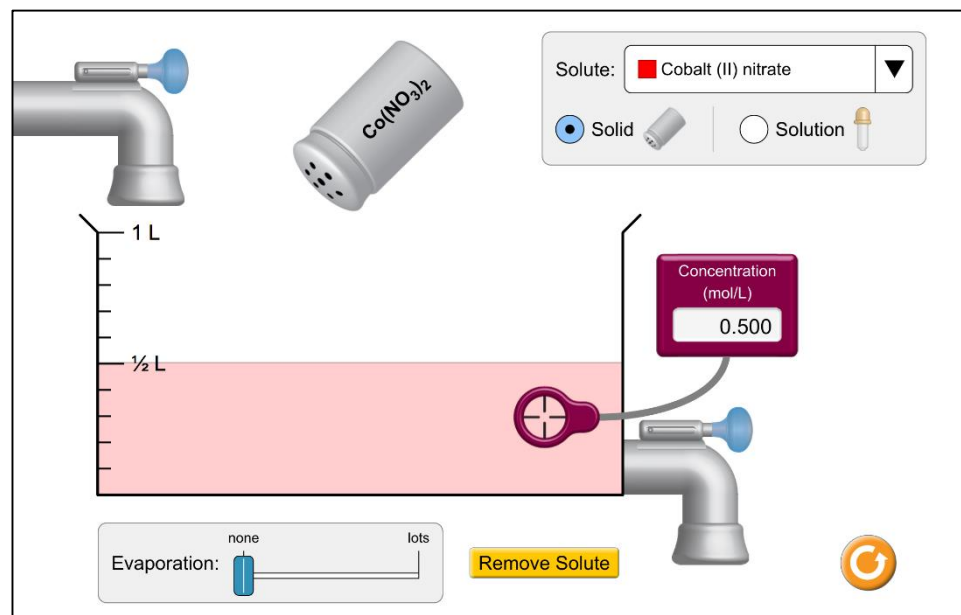
E. (2) and (3)



What will happen to the concentration and the number of moles when water is added?

Concentration Number of moles

- a. Increase Decrease
- b. Increase Increase
- c. No change No change
- d. Decrease Decrease
- e. Decrease No change



How many moles of solute are in the beaker?

The image shows a virtual chemistry lab interface. A beaker contains a pink liquid up to the 1/2 L mark. A digital display shows the concentration is 0.500 mol/L. The solute is Cobalt (II) nitrate, and the state is Solid. The interface includes a faucet, a container of $\text{Co}(\text{NO}_3)_2$, and a 'Remove Solute' button.

a. 0.05 moles

b. 0.50 moles

c. 1.00 moles

d. 1.50 moles

e. None of these

You are given 200 mL of a 0.400 M solution of KMnO_4 .
If you add water until total volume is 800 mL, what will be the final concentration of the solution?

- a. 0.080 M
- b. 0.10 M**
- c. 0.20 M
- d. 0.40 M
- e. 1.6 M

Solute: ▼

Solid Solution

Concentration (mol/L)
0.400

Evaporation: none lots

Remove Solute

You start with 0.1 L of a 5.00 M solution of NiCl_2 , and you plan to dilute it (by adding water) to make a solution with a concentration of 0.625 M. How far should you fill the beaker?

- a. 200 mL
- b. 400 mL
- c. 600 mL
- d. 800 mL**
- e. 1 L

The simulation interface includes the following elements:

- Beaker:** A graduated cylinder with markings for 1 L and 1/2 L. A green liquid is present at the bottom.
- Faucets:** A faucet on the left and a faucet on the right. A purple ring is attached to the right faucet.
- Pipette:** A green pipette with a red stopper and a label NiCl_2 .
- Control Panel (Right):**
 - Solute: Nickel (II) chloride
 - Concentration (mol/L): 5.000
 - Buttons for Solid and Solution (selected)
 - Remove Solute button
 - Refresh button
- Evaporation Slider (Bottom Left):** A slider ranging from none to lots, currently set to none.

You have prepared a 1.0 M solution of NaCl in the laboratory.

What is the concentration of *chloride ions* in the solution?

a. 0.50 M

b. 1.0 M

c. 1.5 M

d. 2.0 M

You have prepared a 1.0 M solution of CaCl_2 in the laboratory.

What is the concentration of *chloride ions* in the solution?

a. 0.50 M

b. 1.0 M

c. 1.5 M

d. 2.0 M

Conductivity pairs

Which of these solutions will have higher conductivity?

A	B	C
0.1 M $\text{KCl}_{(aq)}$	0.2 M $\text{KCl}_{(aq)}$	Not enough information

Conductivity pairs

Which of these solutions will have higher conductivity?

A	B	C
0.1 M $\text{KCl}_{(\text{aq})}$	0.1 M $\text{CaCl}_2_{(\text{aq})}$	Not enough information