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SUBMIT

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Lab Safety 1

You will usually find a set of 'Lab Rules' in a science lab. They are there for your safety!
The drawing below shows a lab where there are no safety rules.



- 1 Write down a list of all the things going wrong in this lab.
- 2 For each of your answers, write a safety rule.
- 3 Design a poster for your lab, showing one safety rule and the reason for having it.

[Developing skills in planning]

Adapted from Exploring Science for QCA Copymaster File 7

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pH and pOH Worksheet

Name Ms. Crittenden ANSWER KEY
Date _____

1. Calculate the pH and pOH of solutions having the following concentration:

a. 0.00010 mole H_3O^+ per liter.	pH = <u>4</u>	pOH = <u>10</u>
b. 0.010 mole OH^- per liter.	pH = <u>12</u>	pOH = <u>2</u>
c. 1.0×10^{-5} mole OH^- per liter.	pH = <u>9</u>	pOH = <u>5</u>
d. 1.0×10^{-2} mole H_3O^+ per liter.	pH = <u>2</u>	pOH = <u>12</u>

2. Calculate the $[H_3O^+]$ of the following solutions:

a. pH = 3.0	[H_3O^+] = <u>$1.0 \times 10^{-3} M$</u>
b. pH = 6.0	[H_3O^+] = <u>$1.0 \times 10^{-6} M$</u>
c. pOH = 12.0	[H_3O^+] = <u>$1.0 \times 10^{-2} M$</u>

3. Calculate the $[OH^-]$ of the following solutions:

a. pOH = 11.0	[OH^-] = <u>$1.0 \times 10^{-11} M$</u>
b. pH = 4.0	[OH^-] = <u>$1.0 \times 10^{-10} M$</u>
c. pOH = 8.0	[OH^-] = <u>$1.0 \times 10^{-8} M$</u>

4. Calculate the pH and pOH of solutions having the following concentrations. Assume 100% ionization. Remember that 1 mole of H_2SO_4 produces 2 moles of H_3O^+ ion.

a. 0.0025 M NaOH	pH = <u>11.4</u>	pOH = <u>2.6</u>
b. 0.0025 M H_2SO_4	pH = <u>2.9</u>	pOH = <u>11.1</u>
c. 0.075 M H_2SO_4	pH = <u>0.82</u>	pOH = <u>13.18</u>
d. 0.048 M HCl	pH = <u>1.3</u>	pOH = <u>12.7</u>
e. 0.032 M KOH	pH = <u>12.5</u>	pOH = <u>1.5</u>
f. 0.00017 M NaOH	pH = <u>10.2</u>	pOH = <u>3.8</u>

5. Calculate the $[H_3O^+]$ and $[OH^-]$ of the following solutions:

a. pH = 2.500	[H_3O^+] = <u>$3.16 \times 10^{-3} M$</u>	[OH^-] = <u>$3.16 \times 10^{-12} M$</u>
b. pOH = 5.800	[H_3O^+] = <u>$3.98 \times 10^{-9} M$</u>	[OH^-] = <u>$1.58 \times 10^{-6} M$</u>
c. pOH = 3.200	[H_3O^+] = <u>$1.58 \times 10^{-11} M$</u>	[OH^-] = <u>$6.31 \times 10^{-3} M$</u>
d. pH = 4.700	[H_3O^+] = <u>$2.00 \times 10^{-5} M$</u>	[OH^-] = <u>$5.01 \times 10^{-9} M$</u>
e. pH = 9.600	[H_3O^+] = <u>$2.51 \times 10^{-10} M$</u>	[OH^-] = <u>$3.98 \times 10^{-5} M$</u>
f. pOH = 10.300	[H_3O^+] = <u>$2.00 \times 10^{-4} M$</u>	[OH^-] = <u>$5.01 \times 10^{-11} M$</u>

6. The approximate pH of some common substances is listed. Calculate the pOH, the $[H_3O^+]$ and the $[OH^-]$.

a. Vinegar 2.8	pOH = <u>11.2</u>	[H_3O^+] = <u>$1.58 \times 10^{-3} M$</u>	[OH^-] = <u>$6.31 \times 10^{-12} M$</u>
b. Orange 3.5	pOH = <u>10.5</u>	[H_3O^+] = <u>$3.16 \times 10^{-4} M$</u>	[OH^-] = <u>$3.16 \times 10^{-11} M$</u>
c. Rainwater 6.2	pOH = <u>7.8</u>	[H_3O^+] = <u>$6.31 \times 10^{-7} M$</u>	[OH^-] = <u>$1.58 \times 10^{-8} M$</u>
d. Seawater 8.5	pOH = <u>5.5</u>	[H_3O^+] = <u>$3.16 \times 10^{-9} M$</u>	[OH^-] = <u>$3.16 \times 10^{-6} M$</u>
e. Soft drink 3.0	pOH = <u>11.0</u>	[H_3O^+] = <u>$1.00 \times 10^{-3} M$</u>	[OH^-] = <u>$1.00 \times 10^{-11} M$</u>
f. Tomato 4.2	pOH = <u>9.8</u>	[H_3O^+] = <u>$6.31 \times 10^{-5} M$</u>	[OH^-] = <u>$1.58 \times 10^{-10} M$</u>
g. Egg 7.8	pOH = <u>6.2</u>	[H_3O^+] = <u>$1.58 \times 10^{-8} M$</u>	[OH^-] = <u>$6.31 \times 10^{-7} M$</u>
f. Milk of magnesia 10.5	pOH = <u>3.5</u>	[H_3O^+] = <u>$3.16 \times 10^{-11} M$</u>	[OH^-] = <u>$3.16 \times 10^{-4} M$</u>

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