

## Chemistry pH and pOH Worksheet

1. Calculate the values of both pH and pOH of the following solutions.

	pH	pOH
0.020 M HCl		
0.0050 M NaOH		
A blood sample $7.2 \times 10^{-8}$ M of $H^+$		
0.0050 M NaOH		

2. Find the values of  $[H^+]$ , pOH, and  $[OH^-]$  that correspond to each of the following pH values.

	$[H^+]$	$[OH^-]$	pOH
pH of lemon juice = 2.9			
pH of sauerkraut = 3.85			
pH of milk of magnesia = 10.81			
pH of orange juice = 4.11			
pH of diluted household ammonia = 11.61			

3. Determine which of the solutions in problem #2 are acidic.

4. A certain brand of root beer has a hydrogen concentration equal to  $1.9 \times 10^{-5}$  M.  
What are the pH and pOH of this root beer?

5. Dr. Pepper has a  $[H^+] = 1.4 \times 10^{-5}$  M. What is its pH?

# Chemistry pH and pOH Worksheet

1. Calculate the values of both pH and pOH of the following solutions.

	pH	pOH
0.020 M HCl	$-\log(0.02) = 1.7$	$14 - 1.7 = 12.3$
0.0050 M NaOH	$14 - 2.3 = 11.7$	$-\log(0.005) = 2.3$
A blood sample $7.2 \times 10^{-8}$ M of $H^+$	$-\log(7.2 \times 10^{-2}) = 7.14$	$14 - 7.14 = 6.86$
0.0050 M NaOH	$14 - 3.46 = 10.54$	$-\log(0.00035) = 3.46$

2. Find the values of  $[H^+]$ , pOH, and  $[OH^-]$  that correspond to each of the following pH values.

	[H <sup>+</sup> ]	[OH <sup>-</sup> ]	pOH
pH of lemon juice = 2.9	$10^{-2.9} = 0.0013$ M	$10^{-11.1} = 7.94 \times 10^{-12}$ M	$14 - 2.9 = 11.1$
pH of sauerkraut = 3.85	$10^{-3.85} = 1.41 \times 10^{-4}$ M	$10^{-10.5} = 7.08 \times 10^{-11}$ M	$14 - 3.85 = 10.15$
pH of milk of magnesia = 10.81	$10^{-10.81} = 1.5 \times 10^{-11}$ M	$10^{-3.19} = 6.46 \times 10^{-4}$ M	$14 - 10.18 = 3.19$
pH of orange juice = 4.11	$10^{-4.11} = 7.76 \times 10^{-5}$ M	$10^{-9.89} = 1.29 \times 10^{-10}$ M	$14 - 4.11 = 9.89$
pH of diluted household ammonia = 11.61	$10^{-11.61} = 2.45 \times 10^{-12}$ M	$10^{-2.39} = 0.0041$ M	$14 - 11.61 = 2.39$

3. Determine which of the solutions in problem #2 are acidic.

$pH < 7$  is acidic. They are lemon juice, sauerkraut, and orange juice

4. A certain brand of root beer has a hydrogen concentration equal to  $1.9 \times 10^{-5}$  M. What are the pH and pOH of this root beer?

$$pH = -\log(1.9 \times 10^{-5}) = 4.72$$

$$pOH = 14 - 4.72 = 9.28$$

5. Dr. Pepper has a  $[H^+] = 1.4 \times 10^{-5}$  M. What is its pH?

$$pH = -\log(1.4 \times 10^{-5}) = 4.85$$