

Answer Key

Oxidation Numbers Worksheet

Directions: Use the *Rules for Assigning Oxidation Numbers* to determine the oxidation number assigned to each element in each of the given chemical formulas.

	Formula	Element and Oxidation Number			
1.	Cl ₂	Cl	0		
2.	Cl ⁻	Cl	-1		
3.	Na	Na	0		
4.	Na ⁺	Na	+1		
5.	O ₂	O	0		
6.	N ₂	N	0		
7.	Al ⁺³	Al	+3		
8.	H ₂ O	H	+1	O	-2
9.	NO ₃ ⁻	N	+5	O	-2
10.	NO ₂	N	+4	O	-2
11.	Cr ₂ O ₇ ²⁻	Cr	+6	O	-2
12.	KCl	K	+1	Cl	-1
13.	NH ₃	N	-3	H	+1
14.	CaH ₂	Ca	+2	H	-1
15.	SO ₄ ²⁻	S	+6	O	-2

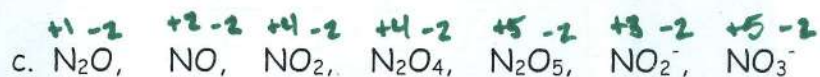
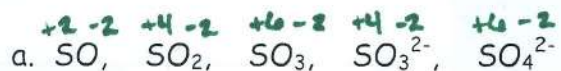
	Formula	Element and Oxidation Number					
16.	Na ₂ O ₂	Na	+1	O	-1		
17.	SiO ₂	Si	+4	O	-2		
18.	CaCl ₂	Ca	+2	Cl	-1		
19.	PO ₄ ³⁻	P	+5	O	-2		
20.	MnO ₂	Mn	+4	O	-2		
21.	FeO	Fe	+2	O	-2		
22.	Fe ₂ O ₃	Fe	+3	O	-2		
23.	H ₂ O ₂	H	+1	O	-1		
24.	CaO	Ca	+2	O	-2		
25.	H ₂ S	H	+1	S	-2		
26.	H ₂ SO ₄	H	+1	S	+6	O	-2
27.	NH ₄ Cl	N	-3	H	+1	Cl	-1
28.	K ₃ PO ₄	K	+1	P	+5	O	-2
29.	HNO ₃	H	+1	N	+5	O	-2
30.	KNO ₂	K	+1	N	+3	O	-2

Rules for Assigning Oxidation Numbers

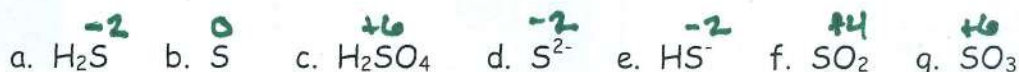
1. The oxidation number of any uncombined element is 0.
2. The oxidation number of a monatomic ion equals the charge on the ion.
3. The more-electronegative element in a binary compound is assigned the number equal to the charge it would have if it were an ion.
4. The oxidation number of fluorine in a compound is always -1.
5. Oxygen has an oxidation number of -2 unless it is combined with F (when it is +2), or it is in a peroxide (such as H₂O₂ or Na₂O₂), when it is -1.
6. The oxidation state of hydrogen in most of its compounds is +1 unless it is combined with a metal, in which case it is -1.
7. In compounds, the elements of groups 1 and 2 as well as aluminum have oxidation numbers of +1, +2, and +3 respectively.
8. The sum of the oxidation numbers of all atoms in a neutral compound is 0.
9. The sum of the oxidation numbers of all atoms in a polyatomic ion equals the charge of the ion.



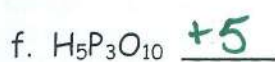
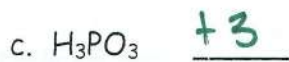
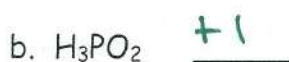
1. Give the oxidation numbers of all the elements in the following molecules and ions:



2. Determine the oxidation number of the sulfur atom:



3. Indicate the oxidation number of phosphorus in each of the following compounds:



4. Give oxidation numbers for the underlined atoms in these molecules and ions:

