

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

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

Rules for Assigning Oxidation Numbers

- The oxidation number of any uncombined element is 0.
- The oxidation number of a monatomic ion equals the charge on the ion.
- The more-electronegative element in a binary compound is assigned the number equal to the charge it would have if it were an ion.
- The oxidation number of fluorine in a compound is always -1.
- 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.
- 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.
- In compounds, the elements of groups 1 and 2 as well as aluminum have oxidation numbers of +1, +2, and +3 respectively.
- The sum of the oxidation numbers of all atoms in a neutral compound is 0.
- The sum of the oxidation numbers of all atoms in a polyatomic ion equals the charge of the ion.

Answer Key											
1.	Cl:0	7.	Al:3+	13.	N:3- H:1+	19.	P:5+ O:2-	25.	H:1+ S:2-		
2.	Cl:1-	8.	H:1+ O:2-	14.	Ca:2+ H:1-	20.	Mn:4+ O:2-	26.	H:1+ S:6+ O:2-		
3.	Na:0	9.	N:5+ O:2-	15.	S:6+ O:2-	21.	Fe:2+ O:2-	27.	N:3- H:1+ Cl:1-		
4.	Na:1+	10.	N:4+ O:2-	16.	Na:1+ O:1-	22.	Fe:3+ O:2-	28.	K:1+ P:5+ O:2-		
5.	O:0	11.	Cr:6+ O:2-	17.	Si:4+ O:2-	23.	H:1+ O:1-	29.	H:1+ N:5+ O:2-		
6.	N:0	12.	K:1+ Cl:1-	18.	Ca:2+ Cl:1-	24.	Ca:2+ O:2-	30.	K:1+ N:3+ O:2-		