

Periodic Table Extra Practice

- Which of the following elements in Period 3 has the greatest metallic character?
 - Ar
 - Si
 - Mg
 - S
- Which sequence of atomic numbers represents elements which have similar chemical properties?
 - 19, 23, 30, 36
 - 9, 16, 33, 50
 - 3, 12, 21, 40
 - 4, 20, 38, 88
- Which elements have the most similar chemical properties?
 - K and Na
 - K and Cl
 - K and Ca
 - K and S
- Which statement explains why ozone gas, O₃, and oxygen gas, O₂, have different properties?
 - They are formed from different elements.
 - They have different molecular structures.
 - They have different oxidation numbers.
 - They have different electronegativities.
- Which of the following atoms has the largest atomic radius?
 - Na
 - K
 - Mg
 - Ca
- Which element is a member of the halogen family?
 - K
 - B
 - I
 - S
- Which atom requires the *least* energy to form a positive ion?
 - Ge
 - Ca
 - Ga
 - K
- At STP, which element is a solid?
 - hydrogen
 - carbon
 - nitrogen
 - argon
- Which element is considered malleable?
 - gold
 - hydrogen
 - sulfur
 - radon
- Atoms of metallic elements tend to
 - gain electrons and form negative ions
 - gain electrons and form positive ions
 - lose electrons and form negative ions
 - lose electrons and form positive ions
- Atom X has an electron configuration of 2-8-2. Which electron-dot symbol correctly represents this atom?
 - $\begin{array}{c} \cdot\cdot \\ \cdot X \cdot \\ \cdot\cdot \end{array}$
 - $\begin{array}{c} \cdot\cdot \\ \cdot X \cdot \\ \cdot \end{array}$
 - $X :$
 - $\begin{array}{c} \cdot \\ \cdot X \cdot \end{array}$
- Which sequence of elements is arranged in order of decreasing atomic radii?
 - Al, Si, P
 - Li, Na, K
 - Cl, Br, I
 - N, C, B
- In the ground state, atoms of which of the following elements have the highest first ionization energy?
 - boron
 - carbon
 - oxygen
 - nitrogen
- As the elements in Group 2 of the Periodic Table are considered in order from top to bottom, the number of electrons in the valence shell
 - decreases
 - increases
 - remains the same
- An atom of which of the following elements has the greatest ability to attract electrons?
 - silicon
 - sulfur
 - nitrogen
 - bromine
- Sodium atoms differ from sodium ions in that sodium atoms contain
 - one more proton
 - one less proton
 - one more electron
 - one less electron
- Which period of the Periodic Table contains more metallic elements than nonmetallic elements?
 - Period 1
 - Period 2
 - Period 3
 - Period 4
- An atom of an element contains 20 protons, 20 neutrons, and 20 electrons. This element is in Group
 - 1
 - 2
 - 4
 - 18
- Which represents the electron configuration of a metalloid in the ground state?
 - 2-3
 - 2-5
 - 2-8-5
 - 2-8-6
- The properties of elements are periodic functions of their
 - mass numbers
 - atomic masses
 - atomic radii
 - atomic numbers
- What is the total number of valence electrons in an atom of phosphorus in the ground state?
 - 5
 - 2
 - 3
 - 7
- More than two-thirds of the elements of the Periodic Table are classified as
 - metalloids
 - metals
 - nonmetals
 - noble gases

23. Elements in the Periodic Table are arranged according to their
- 1) atomic number
 - 2) atomic mass
 - 3) relative activity
 - 4) relative size
24. As the elements Li to F in Period 2 of the Periodic Table are considered in succession, how do the relative electronegativity and the covalent radius of each successive element compare?
- 1) The relative electronegativity decreases, and the atomic radius decreases.
 - 2) The relative electronegativity decreases, and the atomic radius increases.
 - 3) The relative electronegativity increases, and the atomic radius decreases.
 - 4) The relative electronegativity increases, and the atomic radius increases.
25. When the elements in Group 1 are considered in order from top to bottom, each successive element at standard pressure has
- 1) a higher melting point and a higher boiling point
 - 2) a higher melting point and a lower boiling point
 - 3) a lower melting point and a higher boiling point
 - 4) a lower melting point and a lower boiling point
26. Considered in succession, the elements in Period 2 of the Periodic Table show a decrease in atomic radius with increasing atomic number. This may best be explained by the fact that the
- 1) nuclear charge increases
 - 2) number of electron shells increases
 - 3) number of neutrons decreases
 - 4) number of protons decreases
27. Which pair of Group 15 elements are nonmetals?
- 1) nitrogen and arsenic
 - 2) nitrogen and phosphorus
 - 3) phosphorus and bismuth
 - 4) arsenic and antimony
28. Which is a common characteristic of the elements Rb, Te, I, and Xe in the ground state?
- 1) They have the same number of valence electrons.
 - 2) They have similar chemical properties.
 - 3) They have electrons occupying the same number of principal energy levels.
 - 4) They have completely filled principal energy levels.
29. All atoms in a given sample of an element contain the same number of
- 1) nucleons and electrons
 - 2) nucleons and neutrons
 - 3) protons and electrons
 - 4) protons and neutrons
30. Which element is a liquid at room temperature?
- 1) K
 - 2) I₂
 - 3) Hg
 - 4) Mg
31. Which element is a noble gas?
- 1) antimony
 - 2) krypton
 - 3) gold
 - 4) francium
32. What is the total number of electrons in a Mg²⁺ ion?
- 1) 10
 - 2) 2
 - 3) 12
 - 4) 24
33. Which element is *not* a metalloid?
- 1) arsenic
 - 2) boron
 - 3) silicon
 - 4) sulfur
34. Which element is in Group 2 and Period 7 of the Periodic Table?
- 1) magnesium
 - 2) manganese
 - 3) radium
 - 4) radon
35. Which is the most active nonmetal in the Periodic Table of the Elements?
- 1) Na
 - 2) F
 - 3) I
 - 4) Cl
36. Given the electron configuration of an atom in the ground state:
2 - 8 - 6
- This element is found in the Periodic Table in
- 1) Period 4 and Group 16
 - 2) Period 4 and Group 14
 - 3) Period 3 and Group 16
 - 4) Period 3 and Group 14
37. Which characteristics describe most nonmetals in the solid phase?
- 1) They are malleable and have metallic luster.
 - 2) They are malleable and lack metallic luster.
 - 3) They are brittle and have metallic luster.
 - 4) They are brittle and lack metallic luster.
38. Compared to a neon atom, a helium atom has a
- 1) smaller radius
 - 2) smaller first ionization energy
 - 3) larger atomic number
 - 4) greater number of electrons
39. Which element exists as monatomic molecules at STP?
- 1) hydrogen
 - 2) nitrogen
 - 3) argon
 - 4) chlorine
40. Which elements atoms have a larger atomic radius than atoms of silicon?
- 1) sodium
 - 2) carbon
 - 3) sulfur
 - 4) chlorine
41. At STP, potassium is classified as
- 1) a metallic solid
 - 2) a nonmetallic solid
 - 3) a metallic liquid
 - 4) a metalloid solid

42. Elements that readily gain electrons tend to have

- 1) high ionization energy and high electronegativity
- 2) high ionization energy and low electronegativity
- 3) low ionization energy and low electronegativity
- 4) low ionization energy and high electronegativity

Reference Tables

Table S
Properties of Selected Elements

Atomic Number	Symbol	Name	Atomic Weight	Density (g/cm ³)	Melting Point (°C)	Boiling Point (°C)	Electrical Conductivity (Ω ⁻¹ cm ⁻¹)
1	H	Hydrogen	1.008	0.0899	-252.8	-252.8	0.0001
2	He	Helium	4.003	0.1786	-272.2	-272.2	0.0001
3	Li	Lithium	6.941	0.534	180.5	900	3.8 × 10 ⁷
4	Be	Beryllium	9.012	1.848	2975	2970	0.0001
5	B	Boron	10.81	2.34	2075	2550	0.0001
6	C	Carbon	12.01	2.26	3500	3800	0.0001
7	N	Nitrogen	14.01	1.25	-210	-196	0.0001
8	O	Oxygen	16.00	1.43	-218	-183	0.0001
9	F	Fluorine	18.99	1.696	-219	-188	0.0001
10	Ne	Neon	20.18	0.9002	-248.6	-248.6	0.0001
11	Na	Sodium	22.99	0.973	97.8	883	3.8 × 10 ⁷
12	Mg	Magnesium	24.31	1.738	923	1363	0.0001
13	Al	Aluminum	26.98	2.70	933	2467	3.8 × 10 ⁷
14	Si	Silicon	28.09	2.33	1414	2355	0.0001
15	P	Phosphorus	30.97	1.92	44.1	281	0.0001
16	S	Sulfur	32.07	2.07	115.3	444.6	0.0001
17	Cl	Chlorine	35.45	3.214	-34.04	-34.04	0.0001
18	Ar	Argon	39.95	1.781	-189.2	-189.2	0.0001
19	K	Potassium	39.10	0.862	63.5	774	3.8 × 10 ⁷
20	Ca	Calcium	40.08	1.54	842.8	1484	0.0001
21	Sc	Scandium	44.96	2.98	1539	2431	0.0001
22	Ti	Titanium	47.88	4.54	1668	2738	0.0001
23	V	Vanadium	50.94	6.09	1910	3407	0.0001
24	Cr	Chromium	52.00	7.19	1907	2671	0.0001
25	Mn	Manganese	54.94	7.47	1651	2100	0.0001
26	Fe	Iron	55.85	7.874	1538	2750	0.0001
27	Co	Cobalt	58.93	8.90	1495	2709	0.0001
28	Ni	Nickel	58.71	8.908	1455	2730	0.0001
29	Cu	Copper	63.55	8.96	1083	2567	3.8 × 10 ⁷
30	Zn	Zinc	65.38	7.14	924	2587	0.0001
31	Ga	Gallium	69.72	5.907	29.76	2478	0.0001
32	Ge	Germanium	72.64	5.323	938	2833	0.0001
33	As	Arsenic	74.92	5.727	611	887	0.0001
34	Se	Selenium	78.96	4.81	221	685	0.0001
35	Br	Bromine	79.90	3.122	-7.2	58.8	0.0001
36	Kr	Krypton	83.80	3.709	-153	-153	0.0001
37	Rb	Rubidium	85.47	1.498	39.3	688	3.8 × 10 ⁷
38	Sr	Strontium	87.62	2.54	777	1382	0.0001
39	Y	Yttrium	88.91	4.67	1522	2770	0.0001
40	Zr	Zirconium	91.22	6.49	1855	2710	0.0001
41	Nb	Niobium	92.91	8.57	1647	2471	0.0001
42	Hf	Hafnium	178.49	13.31	1579	2371	0.0001
43	Ta	Tantalum	180.95	16.69	1529	2471	0.0001
44	Hg	Mercury	200.59	13.53	-38.83	-38.83	0.0001
45	Tl	Thallium	204.38	11.85	304	727	0.0001
46	Pb	Lead	207.2	11.34	327.3	2042	0.0001
47	Bi	Bismuth	208.98	9.78	271.5	628	0.0001
48	Cd	Cadmium	206.28	8.65	321	961	0.0001
49	In	Indium	204.38	7.31	156.6	2071	0.0001
50	Sn	Tin	207.2	7.28	231.9	2269	0.0001
51	Sb	Antimony	205.97	6.697	630.5	1281	0.0001
52	Te	Tellurium	208.96	6.24	478.3	1261	0.0001
53	I	Iodine	253.8	4.933	113.7	184.3	0.0001
54	Xe	Xenon	253.8	5.841	-108.1	-108.1	0.0001
55	Ba	Barium	253.8	3.51	727	1762	0.0001
56	La	Lanthanum	253.8	9.48	920	1352	0.0001
57	Ce	Cerium	253.8	9.48	795	1289	0.0001
58	Pr	Praseodymium	253.8	9.48	714	1219	0.0001
59	Nd	Niodymium	253.8	9.48	663	1117	0.0001
60	Pm	Promethium	253.8	9.48	610	1020	0.0001
61	Sm	Samarium	253.8	9.48	562	925	0.0001
62	Eu	Europium	253.8	9.48	519	838	0.0001
63	Gd	Gadolinium	253.8	9.48	477	753	0.0001
64	Tb	Terbium	253.8	9.48	434	669	0.0001
65	Dy	Dysprosium	253.8	9.48	391	585	0.0001
66	Ho	Holmium	253.8	9.48	348	501	0.0001
67	Er	Erbium	253.8	9.48	305	417	0.0001
68	Tm	Thulium	253.8	9.48	262	333	0.0001
69	Yb	Ytterbium	253.8	9.48	219	249	0.0001
70	Lu	Lutetium	253.8	9.48	176	165	0.0001
71	Hf	Hafnium	253.8	9.48	133	71	0.0001
72	Ta	Tantalum	253.8	9.48	70	7	0.0001
73	W	Tungsten	253.8	9.48	7	7	0.0001
74	Re	Rhenium	253.8	9.48	7	7	0.0001
75	Os	Osmium	253.8	9.48	7	7	0.0001
76	Ir	Iridium	253.8	9.48	7	7	0.0001
77	Pt	Platinum	253.8	9.48	7	7	0.0001
78	Au	Gold	253.8	9.48	7	7	0.0001
79	Hg	Mercury	253.8	9.48	7	7	0.0001
80	Tl	Thallium	253.8	9.48	7	7	0.0001
81	Pb	Lead	253.8	9.48	7	7	0.0001
82	Bi	Bismuth	253.8	9.48	7	7	0.0001
83	Po	Polonium	253.8	9.48	7	7	0.0001
84	At	Astatine	253.8	9.48	7	7	0.0001
85	Fr	Francium	253.8	9.48	7	7	0.0001
86	Ra	Radium	253.8	9.48	7	7	0.0001
87	Ac	Actinium	253.8	9.48	7	7	0.0001
88	Th	Thorium	253.8	9.48	7	7	0.0001
89	Pa	Protactinium	253.8	9.48	7	7	0.0001
90	U	Uranium	253.8	9.48	7	7	0.0001
91	Np	Neptunium	253.8	9.48	7	7	0.0001
92	Pu	Plutonium	253.8	9.48	7	7	0.0001
93	Am	Americium	253.8	9.48	7	7	0.0001
94	Cm	Curium	253.8	9.48	7	7	0.0001
95	Bk	Berkelium	253.8	9.48	7	7	0.0001
96	Cf	Californium	253.8	9.48	7	7	0.0001
97	Es	Einsteinium	253.8	9.48	7	7	0.0001
98	Fm	Fermium	253.8	9.48	7	7	0.0001
99	Mn	Mendelevium	253.8	9.48	7	7	0.0001
100	Lr	Lutetium	253.8	9.48	7	7	0.0001
101	Uu	Ununium	253.8	9.48	7	7	0.0001
102	Uub	Unbium	253.8	9.48	7	7	0.0001
103	Uuc	Untrium	253.8	9.48	7	7	0.0001
104	Uuq	Unquadium	253.8	9.48	7	7	0.0001
105	Uuq	Unquadium	253.8	9.48	7	7	0.0001
106	Uuh	Unhexium	253.8	9.48	7	7	0.0001
107	Uuh	Unhexium	253.8	9.48	7	7	0.0001
108	Uuq	Unquadium	253.8	9.48	7	7	0.0001
109	Uuq	Unquadium	253.8	9.48	7	7	0.0001
110	Uuh	Unhexium	253.8	9.48	7	7	0.0001
111	Uuh	Unhexium	253.8	9.48	7	7	0.0001
112	Uuq	Unquadium	253.8	9.48	7	7	0.0001
113	Uuq	Unquadium	253.8	9.48	7	7	0.0001
114	Uuh	Unhexium	253.8	9.48	7	7	0.0001
115	Uuh	Unhexium	253.8	9.48	7	7	0.0001
116	Uuq	Unquadium	253.8	9.48	7	7	0.0001
117	Uuh	Unhexium	253.8	9.48	7	7	0.0001
118	Uuo	Unogium	253.8	9.48	7	7	0.0001
119	Uuo	Unogium	253.8	9.48	7	7	0.0001
120	Uuo	Unogium	253.8	9.48	7	7	0.0001

Answer Key
[New Exam]

1. 3
2. 4
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 37. 4
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 41. 1
 42. 1
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