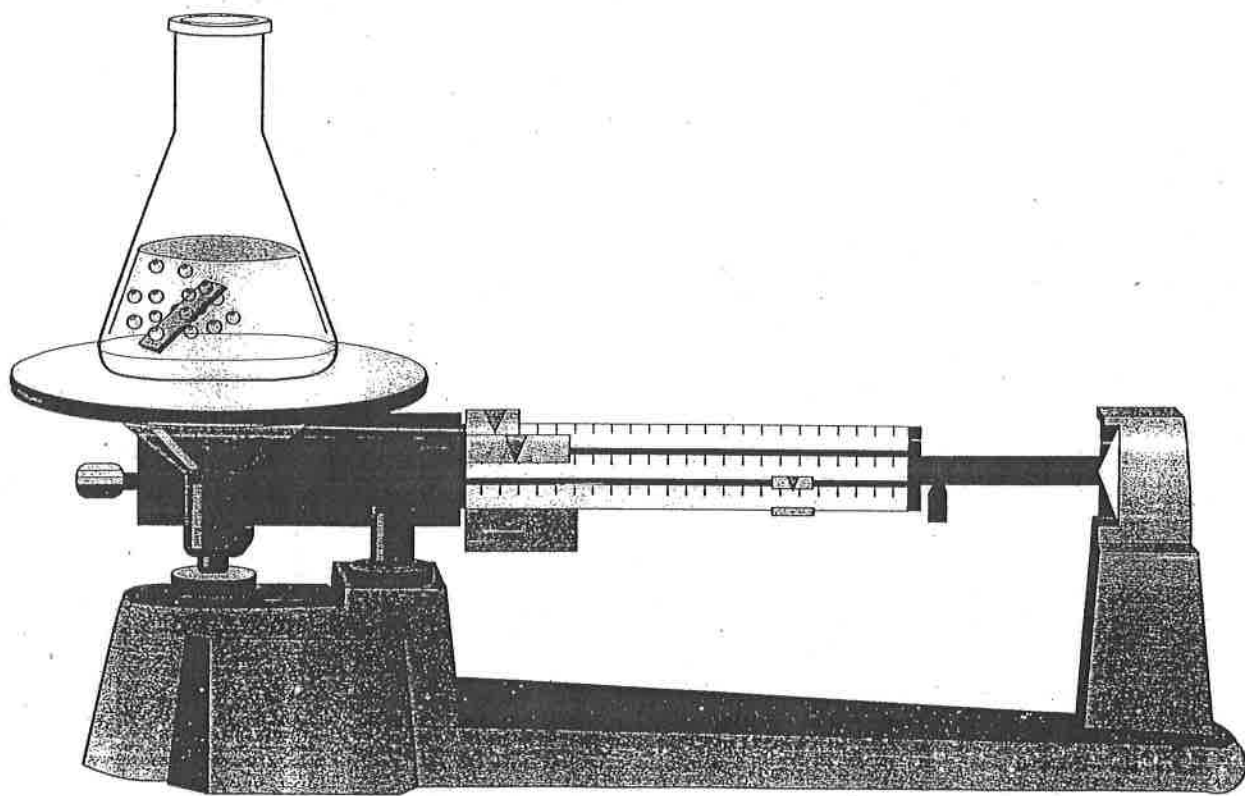


# Data Booklet

---

## CHEMISTRY 11

Work done in this booklet  
will not be marked.



# Activity Series

## Metals

- Lithium - most active
- Potassium
- Calcium
- Sodium
- Magnesium
- Aluminum
- Zinc
- Chromium
- Iron
- Nickel
- Tin
- Lead
- Hydrogen
- Copper
- Silver
- Mercury
- Platinum
- Gold - least active

## Nonmetals

- Fluorine
- Chlorine
- Bromine
- Iodine

An element higher on the list will replace an element lower on the list in a single replacement reaction.

# PERIODIC TABLE OF THE ELEMENTS

1		NON-METALS										METALS										18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
H		He		Li		Be		B		C		N		O		F		Ne		Na		Mg		Al		Si		P		S		Cl		Ar																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Hydrogen 1.0		Helium 4.0		Lithium 6.9		Beryllium 9.0		Boron 10.8		Carbon 12.0		Nitrogen 14.0		Oxygen 16.0		Fluorine 19.0		Neon 20.2		Sodium 23.0		Magnesium 24.3		Aluminum 27.0		Silicon 28.1		Phosphorus 31.0		Sulfur 32.1		Chlorine 35.5		Argon 39.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
+		2+		3+		4+		5+		6+		7+		8+		9+		10+		11+		12+		13+		14+		15+		16+		17+		18+																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Atomic Number		Symbol		Name		Atomic Mass		Ion charge(s)		Symbol		Name		Atomic Mass		Ion charge(s)		Symbol		Name		Atomic Mass		Ion charge(s)		Symbol		Name		Atomic Mass		Ion charge(s)		Symbol		Name		Atomic Mass																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1	H	3	Li	4	Be	11	Na	12	Mg	13	Al	14	Si	15	P	16	S	17	Cl	18	Ar	19	K	20	Ca	21	Sc	22	Ti	23	V	24	Cr	25	Mn	26	Fe	27	Co	28	Ni	29	Cu	30	Zn	31	Ga	32	Ge	33	As	34	Se	35	Br	36	Kr	37	Rb	38	Sr	39	Y	40	Zr	41	Nb	42	Mo	43	Tc	44	Ru	45	Rh	46	Pd	47	Ag	48	Cd	49	In	50	Sn	51	Sb	52	Te	53	I	54	Xe	55	Cs	56	Ba	57	La	58	Ce	59	Pr	60	Nd	61	Pm	62	Sm	63	Eu	64	Gd	65	Tb	66	Dy	67	Ho	68	Er	69	Tm	70	Yb	71	Lu	72	Hf	73	Ta	74	W	75	Re	76	Os	77	Ir	78	Pt	79	Au	80	Hg	81	Tl	82	Pb	83	Bi	84	Po	85	At	86	Rn	87	Fr	88	Ra	89	Ac	90	Th	91	Pa	92	U	93	Np	94	Pu	95	Am	96	Cm	97	Bk	98	Cf	99	Es	100	Fm	101	Md	102	No	103	Lr	104	Rf	105	Db	106	Sg	107	Bh	108	Hs	109	Mt	110	Ds	111	Rg	112	Cn	113	Nh	114	Fl	115	Mc	116	Lv	117	Ts	118	Og	119	Uu	120	Uub	121	Uut	122	Uuq	123	Uup	124	Uuq	125	Uup	126	Uuh	127	Uuq	128	Uup	129	Uuh	130	Uuq	131	Uup	132	Uuh	133	Uuq	134	Uup	135	Uuh	136	Uuq	137	Uup	138	Uuh	139	Uuq	140	Uup	141	Uuh	142	Uuq	143	Uup	144	Uuh	145	Uuq	146	Uup	147	Uuh	148	Uuq	149	Uup	150	Uuh	151	Uuq	152	Uup	153	Uuh	154	Uuq	155	Uup	156	Uuh	157	Uuq	158	Uup	159	Uuh	160	Uuq	161	Uup	162	Uuh	163	Uuq	164	Uup	165	Uuh	166	Uuq	167	Uup	168	Uuh	169	Uuq	170	Uup	171	Uuh	172	Uuq	173	Uup	174	Uuh	175	Uuq	176	Uup	177	Uuh	178	Uuq	179	Uup	180	Uuh	181	Uuq	182	Uup	183	Uuh	184	Uuq	185	Uup	186	Uuh	187	Uuq	188	Uup	189	Uuh	190	Uuq	191	Uup	192	Uuh	193	Uuq	194	Uup	195	Uuh	196	Uuq	197	Uup	198	Uuh	199	Uuq	200	Uup	201	Uuh	202	Uuq	203	Uup	204	Uuh	205	Uuq	206	Uup	207	Uuh	208	Uuq	209	Uup	210	Uuh	211	Uuq	212	Uup	213	Uuh	214	Uuq	215	Uup	216	Uuh	217	Uuq	218	Uup	219	Uuh	220	Uuq	221	Uup	222	Uuh	223	Uuq	224	Uup	225	Uuh	226	Uuq	227	Uup	228	Uuh	229	Uuq	230	Uup	231	Uuh	232	Uuq	233	Uup	234	Uuh	235	Uuq	236	Uup	237	Uuh	238	Uuq	239	Uup	240	Uuh	241	Uuq	242	Uup	243	Uuh	244	Uuq	245	Uup	246	Uuh	247	Uuq	248	Uup	249	Uuh	250	Uuq	251	Uup	252	Uuh	253	Uuq	254	Uup	255	Uuh	256	Uuq	257	Uup	258	Uuh	259	Uuq	260	Uup	261	Uuh	262	Uuq	263	Uup	264	Uuh	265	Uuq	266	Uup	267	Uuh	268	Uuq	269	Uup	270	Uuh	271	Uuq	272	Uup	273	Uuh	274	Uuq	275	Uup	276	Uuh	277	Uuq	278	Uup	279	Uuh	280	Uuq	281	Uup	282	Uuh	283	Uuq	284	Uup	285	Uuh	286	Uuq	287	Uup	288	Uuh	289	Uuq	290	Uup	291	Uuh	292	Uuq	293	Uup	294	Uuh	295	Uuq	296	Uup	297	Uuh	298	Uuq	299	Uup	300	Uuh	301	Uuq	302	Uup	303	Uuh	304	Uuq	305	Uup	306	Uuh	307	Uuq	308	Uup	309	Uuh	310	Uuq	311	Uup	312	Uuh	313	Uuq	314	Uup	315	Uuh	316	Uuq	317	Uup	318	Uuh	319	Uuq	320	Uup	321	Uuh	322	Uuq	323	Uup	324	Uuh	325	Uuq	326	Uup	327	Uuh	328	Uuq	329	Uup	330	Uuh	331	Uuq	332	Uup	333	Uuh	334	Uuq	335	Uup	336	Uuh	337	Uuq	338	Uup	339	Uuh	340	Uuq	341	Uup	342	Uuh	343	Uuq	344	Uup	345	Uuh	346	Uuq	347	Uup	348	Uuh	349	Uuq	350	Uup	351	Uuh	352	Uuq	353	Uup	354	Uuh	355	Uuq	356	Uup	357	Uuh	358	Uuq	359	Uup	360	Uuh	361	Uuq	362	Uup	363	Uuh	364	Uuq	365	Uup	366	Uuh	367	Uuq	368	Uup	369	Uuh	370	Uuq	371	Uup	372	Uuh	373	Uuq	374	Uup	375	Uuh	376	Uuq	377	Uup	378	Uuh	379	Uuq	380	Uup	381	Uuh	382	Uuq	383	Uup	384	Uuh	385	Uuq	386	Uup	387	Uuh	388	Uuq	389	Uup	390	Uuh	391	Uuq	392	Uup	393	Uuh	394	Uuq	395	Uup	396	Uuh	397	Uuq	398	Uup	399	Uuh	400	Uuq	401	Uup	402	Uuh	403	Uuq	404	Uup	405	Uuh	406	Uuq	407	Uup	408	Uuh	409	Uuq	410	Uup	411	Uuh	412	Uuq	413	Uup	414	Uuh	415	Uuq	416	Uup	417	Uuh	418	Uuq	419	Uup	420	Uuh	421	Uuq	422	Uup	423	Uuh	424	Uuq	425	Uup	426	Uuh	427	Uuq	428	Uup	429	Uuh	430	Uuq	431	Uup	432	Uuh	433	Uuq	434	Uup	435	Uuh	436	Uuq	437	Uup	438	Uuh	439	Uuq	440	Uup	441	Uuh	442	Uuq	443	Uup	444	Uuh	445	Uuq	446	Uup	447	Uuh	448	Uuq	449	Uup	450	Uuh	451	Uuq	452	Uup	453	Uuh	454	Uuq	455	Uup	456	Uuh	457	Uuq	458	Uup	459	Uuh	460	Uuq	461	Uup	462	Uuh	463	Uuq	464	Uup	465	Uuh	466	Uuq	467	Uup	468	Uuh	469	Uuq	470	Uup	471	Uuh	472	Uuq	473	Uup	474	Uuh	475	Uuq	476	Uup	477	Uuh	478	Uuq	479	Uup	480	Uuh	481	Uuq	482	Uup	483	Uuh	484	Uuq	485	Uup	486	Uuh	487	Uuq	488	Uup	489	Uuh	490	Uuq	491	Uup	492	Uuh	493	Uuq	494	Uup	495	Uuh	496	Uuq	497	Uup	498	Uuh	499	Uuq	500	Uup	501	Uuh	502	Uuq	503	Uup	504	Uuh	505	Uuq	506	Uup	507	Uuh	508	Uuq	509	Uup	510	Uuh	511	Uuq	512	Uup	513	Uuh	514	Uuq	515	Uup	516	Uuh	517	Uuq	518	Uup	519	Uuh	520	Uuq	521	Uup	522	Uuh	523	Uuq	524	Uup	525	Uuh	526	Uuq	527	Uup	528	Uuh	529	Uuq	530	Uup	531	Uuh	532	Uuq	533	Uup	534	Uuh	535	Uuq	536	Uup	537	Uuh	538	Uuq	539	Uup	540	Uuh	541	Uuq	542	Uup	543	Uuh	544	Uuq	545	Uup	546	Uuh	547	Uuq	548	Uup	549	Uuh	550	Uuq	551	Uup	552	Uuh	553	Uuq	554	Uup	555	Uuh	556	Uuq	557	Uup	558	Uuh	559	Uuq	560	Uup	561	Uuh	562	Uuq	563	Uup	564	Uuh	565	Uuq	566	Uup	567	Uuh	568	Uuq	569	Uup	570	Uuh	571	Uuq	572	Uup	573	Uuh	574	Uuq	575	Uup	576	Uuh	577	Uuq	578	Uup	579	Uuh	580	Uuq	581	Uup	582	Uuh	583	Uuq	584	Uup	585	Uuh	586	Uuq	587	Uup	588	Uuh	589	Uuq	590	Uup	591	Uuh	592	Uuq	593	Uup	594	Uuh	595	Uuq	596	Uup	597	Uuh	598	Uuq	599	Uup	600	Uuh	601	Uuq	602	Uup	603	Uuh	604	Uuq	605	Uup	606	Uuh	607	Uuq	608	Uup	609	Uuh	610	Uuq	611	Uup	612	Uuh	613	Uuq	614	Uup	615	Uuh	616	Uuq	617	Uup	618	Uuh	619	Uuq	620	Uup	621	Uuh	622	Uuq	623	Uup	624	Uuh	625	Uuq	626	Uup	627	Uuh	628	Uuq	629	Uup	630	Uuh	631	Uuq	632	Uup	633	Uuh	634	Uuq	635	Uup	636	Uuh	637	Uuq	638	Uup	639	Uuh	640	Uuq	641	Uup	642	Uuh	643	Uuq	644	Uup	645	Uuh	646	Uuq	647	Uup	648	Uuh	649	Uuq	650	Uup	651	Uuh	652	Uuq	653	Uup	654	Uuh	655	Uuq	656	Uup	657	Uuh	658	Uuq	659	Uup	660	Uuh	661	Uuq	662	Uup	663	Uuh	664	Uuq	665	Uup	666	Uuh	667	Uuq	668	Uup	669	Uuh	670	Uuq	671	Uup	672	Uuh	673	Uuq	674	Uup	675	Uuh	676	Uuq	677	Uup	678	Uuh	679	Uuq	680	Uup	681	Uuh	682	Uuq	683	Uup	684	Uuh	685	Uuq	686	Uup	687	Uuh	688	Uuq	689	Uup	690	Uuh	691	Uuq	692	Uup	693	Uuh	694	Uuq	695	Uup	696	Uuh	697	Uuq	698	Uup	699	Uuh	700	Uuq	701	Uup	702	Uuh	703	Uuq	704	Uup	705	Uuh	706	Uuq	707	Uup	708	Uuh	709	Uuq	710	Uup	711	Uuh	712	Uuq	713	Uup	714	Uuh	715	Uuq	716	Uup	717	Uuh	718	Uuq	719	Uup	720	Uuh	721	Uuq	722	Uup	723	Uuh	724	Uuq	725	Uup	726	Uuh	727	Uuq	728	Uup	729	Uuh	730	Uuq	731	Uup	732	Uuh	733	Uuq	734	Uup	735	Uuh	736	Uuq	737	Uup	738	Uuh	739	Uuq	740	Uup	741	Uuh	742	Uuq	743	Uup	744	Uuh	745	Uuq	746	Uup	747	Uuh	748	Uuq	74

## NAMES, FORMULAE, AND CHARGES OF SOME COMMON IONS

\* Aqueous solutions are readily oxidized by air.  
\*\* Not stable in aqueous solutions.

### POLYATOMIC CATION

$\text{NH}_4^+$  Ammonium

### ACIDS

HCl – hydrochloric acid

HBr – hydrobromic acid

HF – hydrofluoric acid

HI – hydroiodic acid

$\text{HNO}_3$  – nitric acid

$\text{HNO}_2$  – nitrous acid

$\text{H}_2\text{SO}_4$  – sulphuric acid

$\text{H}_2\text{SO}_3$  – sulphurous acid

$\text{H}_2\text{CO}_3$  – carbonic acid

$\text{CH}_3\text{COOH}$  – acetic acid

$\text{H}_3\text{PO}_4$  – phosphoric acid

### Negative Ions (Anions)

$\text{Br}^-$ Bromide	$\text{OH}^-$ Hydroxide
$\text{CO}_3^{2-}$ Carbonate	$\text{ClO}^-$ Hypochlorite
$\text{ClO}_3^-$ Chlorate	$\text{I}^-$ Iodide
$\text{Cl}^-$ Chloride	$\text{HPO}_4^{2-}$ Monohydrogen phosphate
$\text{ClO}_2^-$ Chlorite	$\text{NO}_3^-$ Nitrate
$\text{CrO}_4^{2-}$ Chromate	$\text{NO}_2^-$ Nitrite
$\text{CN}^-$ Cyanide	$\text{C}_2\text{O}_4^{2-}$ Oxalate
$\text{Cr}_2\text{O}_7^{2-}$ Dichromate	$\text{O}^{2-}$ Oxide**
$\text{H}_2\text{PO}_4^-$ Dihydrogen phosphate	$\text{ClO}_4^-$ Perchlorate
$\text{CH}_3\text{COO}^-$ Ethanoate, acetate	$\text{MnO}_4^-$ Permanganate
$\text{F}^-$ Fluoride	$\text{PO}_4^{3-}$ Phosphate
$\text{HCO}_3^-$ Hydrogen carbonate, bicarbonate	$\text{SO}_4^{2-}$ Sulphate
$\text{HC}_2\text{O}_4^-$ Hydrogen oxalate, binoxalate	$\text{S}^{2-}$ Sulphide
$\text{HSO}_4^-$ Hydrogen sulphate, bisulphate	$\text{SO}_3^{2-}$ Sulphite
$\text{HS}^-$ Hydrogen sulphide, bisulphide	$\text{SCN}^-$ Thiocyanate
$\text{HSO}_3^-$ Hydrogen sulphite, bisulphite	



# SOLUBILITY OF COMMON COMPOUNDS IN WATER

*The term soluble here means > 0.1 mol/L at 25°C.*

Negative Ions (Anions)	Positive Ions (Cations)	Solubility of Compounds
All	Alkali ions: $\text{Li}^+$ , $\text{Na}^+$ , $\text{K}^+$ , $\text{Rb}^+$ , $\text{Cs}^+$ , $\text{Fr}^+$	Soluble
All	Hydrogen ion: $\text{H}^+$	Soluble
All	Ammonium ion: $\text{NH}_4^+$	Soluble
Nitrate, $\text{NO}_3^-$	All	Soluble
Chloride, $\text{Cl}^-$ or Bromide, $\text{Br}^-$ or Iodide, $\text{I}^-$	All others	Soluble
	$\text{Ag}^+$ , $\text{Pb}^{2+}$ , $\text{Cu}^+$	Low Solubility
Sulphate, $\text{SO}_4^{2-}$	All others	Soluble
	$\text{Ag}^+$ , $\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$ , $\text{Pb}^{2+}$	Low Solubility
Sulphide, $\text{S}^{2-}$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$ , $\text{Be}^{2+}$ , $\text{Mg}^{2+}$ , $\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$	Soluble
	All others	Low Solubility
Hydroxide, $\text{OH}^-$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$ , $\text{Sr}^{2+}$	Soluble
	All others	Low Solubility
Phosphate, $\text{PO}_4^{3-}$ or Carbonate, $\text{CO}_3^{2-}$ or Sulphite, $\text{SO}_3^{2-}$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$	Soluble
	All others	Low Solubility