The chemical composition of Earth's atmosphere I

Mole %	*Name*	*Chemical formula*	*Residence Time*
78.084	Nitrogen	N_2	10^6-10^7 years
20.948	Oxygen	O_2	3000-10,000 years
0.934	Argon	Ar	Forever
0.004 - 4	Water vapor	H_2O	~10 days
0.0385 (385 ppm)	Carbon dioxide	CO_2	2-10 years
0.001818 (18.18 ppm)	Neon	Ne	Forever
0.000524 (5.24 ppm)	Helium	He	~10^6 years
0.00017 (1.7 ppm)	Methane	CH_4	2-10 years
0.000114 (1.14 ppm)	Krypton	Kr	Forever
0.00005 - 0.0010	Stratospheric ozone	O_3	
0.000055 (0.55 ppm)	Hydrogen	H_2	4-8 years
0.000033 (0.33 ppm)	Nitrous oxide	N_2O	5-200 years
0.0000050 - 0.0000200	Carbon monoxide	CO	60-200 days
0.0000087 (87 ppb)	Xenon	Xe	Forever
0.0000010 - 0.0000500	Tropospheric ozone	O_3	
0.0000005 - 0.0000020	NMHC (Non-methane hydrocarbons)	C_xH_y	
0.0000000540 (540 ppt)	CFC12	CF_2Cl_2	>80 years
0.00000005 (500 ppt)	Carbonyl sulfide	OCS	~ 2 years
0.0000000265 (265 ppt)	CFC11	$CFCl_3$	~80 years
0.00000001 - 0.000001	Hydrogen peroxide	H_2O_2	1 day
0.00000001 - 0.0000001	Formaldehyde	CH_2O	5-10 days
0.0000000098 (98 ppt)	Carbon tetrachloride	CCl_4	≥ decades
0.0000000065 (65 ppt)	Methylchloroform	CH_3CCl_3	~7 years
0.000000001 - 0.0001	Nitrogen oxides	NO_x	A few days
0.000000001 - 0.0000001	Ammonia	NH_3	A few days
0.000000001 - 0.0000001	Sulfur dioxide	SO_2	hours to weeks
0.000000001 - 0.00000001	Dimethyl sulfide	CH_3SCH_3	<1 day
0.0000000001 - 0.00000003	Carbon disulfide	CS_2	~40 days
0.0000000005 - 0.00000005	Hydrogen sulfide	H_2S	<5 days
0.0000000002 (2 ppt)	Hydroperoxyl radical	HO_2	
0.000000000005 (0.05 ppt)	Hydroxyl radical	OH	≤ a few seconds

At left is a table showing the chemical composition of Earth's atmosphere. The table is organized in order of concentration in the atmopshere. However, many of the minor components have variable concentrations, so the order of concentrations in any given atmospheric sample might differ from the order shown here.

Such tables vary, and this one is somewhat deviant in including water vapor, an atmospheric component so prone to change that it condenses as rain, fog, and snow. This table is also a bit odd in showing ozone twice, first with its stratospheric concentration and secondly with its tropospheric concentration. Lists also vary with regard to the minor components, and a more complete list could go on to many more compounds than those shown here.

The leftmost column shows concentrations with decimals to emphasize the difference between abundant species and rare species. In addition, where convenient, concentrations are shown in ppm (parts per million), ppb (parts per billion), or ppt (parts per trillion). The concentrations sum to more than 100% because some components were not included in the source from which the concentrations were taken, and because the concentration of CO_2 has increased.

Sources:
Heicklen, J., 1976, *Atmospheric Chemistry:* New York, Academic Press, 406 p.
Hobbs, P.V., 2000, *Introduction to Atmospheric Chemistry:* Cambridge, Cambridge University Press, 262 p.
Holland, H.D., 1978, *The Chemistry of the Atmosphere and Oceans:* New York, John Wiley & Sons, 351 p.
Makide, Y., & Rowland, F.S., 1981, Tropospheric concentrations of methylchloroform . . . and . . . atmospheric residence times of hydrohalocarbons: *Proc. Natl. Acad. Sci.,* v. 78, p. 5933-5937.
McEwan, M.J., and Phillips, L.F., 1975, *Chemistry of the Atmosphere:* New York, John Wiley & Sons, 301 p.
Prinn, R.G., 2003, Ozone, hydroxyl radical, and oxidative capacity, in Keeling, R.F., ed., *Treatise on Geochemistry, v. 4: The Atmosphere:* Amsterdam, Elsevier, p. 1-19.
Singh, H.B., Fowler, D.P., & Peyton, T.O., 1976, Atmospheric carbon tetrachloride . . . : *Science,* v. 192, p. 1231-1234.