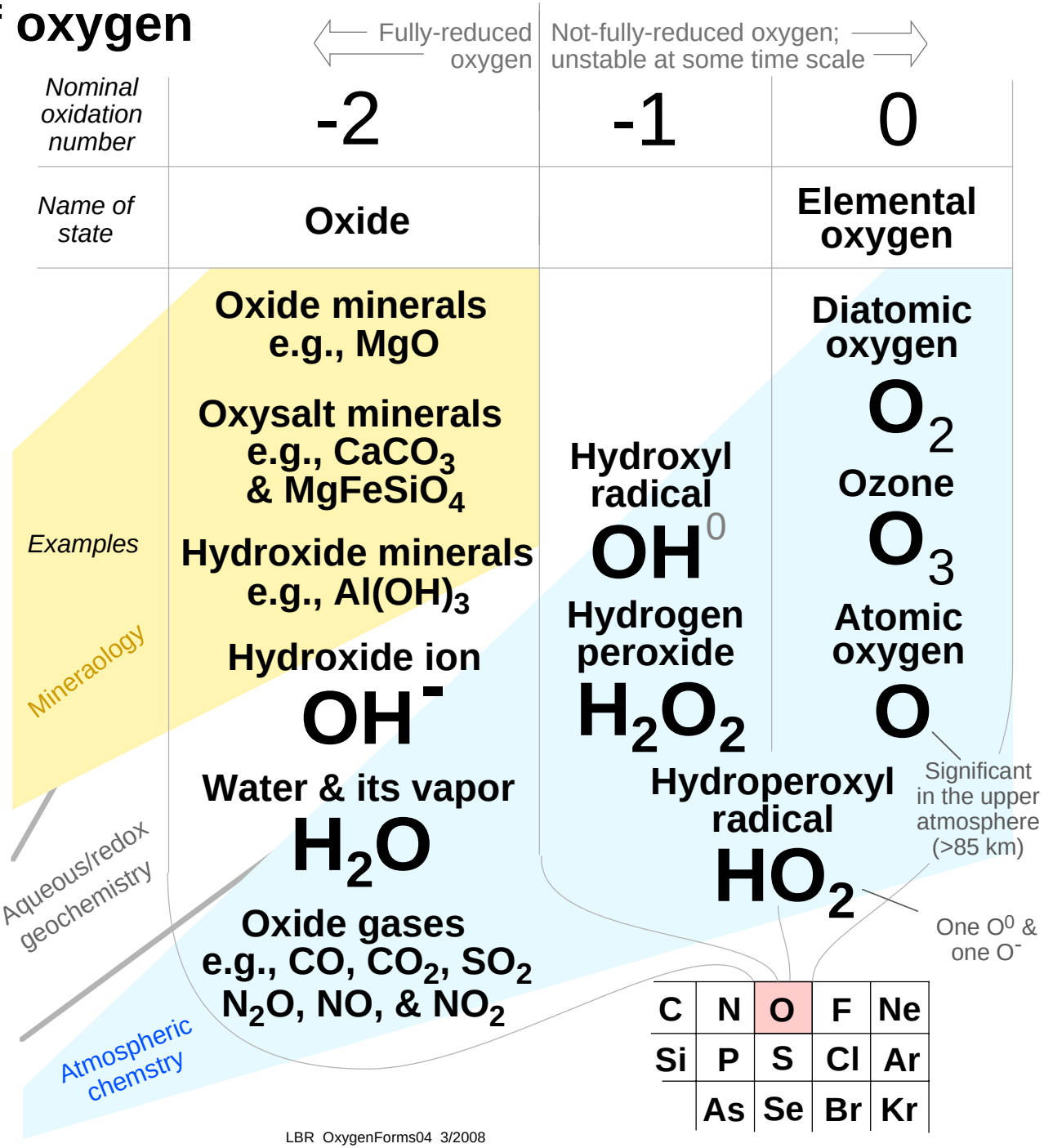
The multiple forms of oxygen

Mineralogists think of oxygen in its 2- oxidation state in minerals, and geochemists additionally think about it as elemental diatomic oxygen (O_2) in redox geochemistry. However, that's just a beginning if one additionally considers chemical processes in the atmosphere. As the table at right shows with its blue region, atmospheric chemistry additionally deals with ozone, with peroxide, and with oxide gases. The interaction of the less-reduced forms of oxygen with the not-fully-oxidized gases (SO_2, NO, NO_2, etc.) provides much entertainment in atmospheric chemistry.

One very important point to note here is the difference between OH, the highly reactive hydroxyl radical, and the hydroxide ion OH^-, the entity found in water that we can think of as dissociated H_2O. In the table at right, the OH representing the peroxide radical has a "0" superscript to remind readers of its overall neutral charge, but most authors and printers leave it simply as an unadorned "OH". Thus the names and chemical symbols for OH and OH^- look much alike, but the two chemical entities are very different.



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