Chemical Equilibrium in Stellar Metamorphosis

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Abstract: In stellar metamorphosis stars are not in chemical equilibrium, because their pressures, temperatures and concentrations of their chemical components change greatly during their evolution.

According to stellar metamorphosis, stars are non-equilibrium dissipative structures. As well, they are not in chemical equilibrium either, as their pressures, temperatures and concentrations of their chemical components change greatly as they become life hosting stars, called "planets". This is restating differently Le Chatelier's principle, in that, *"if a system at equilibrium is disturbed by a change in temperature, pressure, or the concentration of one of the components, the system will shift its equilibrium position so as to counteract the effect of the disturbance."*

For a simple example, we can remove hydrogen gas as both a product and/or reactant on large scales due to photoevaporation and the like from a hotter host, as per the principle of diminishing solar abundances. The constant shift in equilibrium amounts to an object which is not in equilibrium though, so the star is not only dynamic, but reliant on outside changes as well as internal ones. This meaning the changes a star experiences as it evolves are not stepped, but continuous. They are in a constant state of imbalance, which is why they evolve. Systems that are balanced all the time probably do not evolve.

To remove the large hydrogen envelope of a young star is to both cause it to reduce the concentration of hydrogen, to reduce the internal pressures and also reduce the volume as the majority of young stars are supposedly comprised of hydrogen. So it would have a three-fold effect on all the internal interactions, not to mention to allow for any internal heat to escape in larger amounts due to the star no longer possessing a thick hydrogen upper layer to block internal heat loss.

"Stars are in a perpetual state of chemical non-equilibrium as they evolve into life hosting worlds, per Le Chatelier's Principle, as they lose heat, pressure and the concentrations of stellar chemistry change, per the general theory of stellar metamorphosis."