# The Astrochemical Principle of Planet Formation and Stellar Evolution According to Stellar Metamorphosis

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Abstract: It is presented a rule of thumb or principle with regards to astrochemical understanding in explaining planet formation and stellar evolution. Some additional ideas are also added to clarify this principle with regards to the rock cycle and basic geological features, such as promoting "magma" as surface activity earlier in Earth's history.

Since it is known that new stars cool, evolve and die to become what are called planets via the General Theory of Stellar Metamorphosis, we can set up a basic principle of astrochemistry to streamline most inquiry into the matter.

**"The majority of chemical reactions in the universe take place inside of stars as they cool and die, not in the interstellar medium."**

The purpose of this paper and statement is to redirect scientists towards stars as being the location for thermochemical, electrochemical and photochemical reactions. They are the locations for the majority of the radiation production, and chemical reactions which occur in outer space. Stars form chemicals in huge amounts, and as they die, evolve and disintegrate themselves and other older stars, the material then floats about in the interstellar medium after the fact, as a direct result of flaring, CME’s, solar wind, photoevaporation and impact events. Any studies that ignore stars as being the locations for the majority of chemical synthesis and/or decomposition reactions is misguided.

As well, the majority of physical and chemical mixing of elements, molecules and compounds happens in a star as it evolves during early and middle stages of metamorphosis. Once the star moves beyond ocean world stages most of the physical and chemical reactions and mixing has already occurred. The star does the most of its chemistry (both physical and chemical changes) concerning elements, molecules and compounds as it cools down and those compounds can then form and mix together forming more and more complex material.

Once the material begins solidifying the majority of chemical reactions that occurred on the star cease. It is only *after* the chemistry has taken place to form the rocks/minerals chemical structures can deformation, weathering, deposition, remelting, and crushing/squeezing of rocks and minerals occur. This means that the majority of the chemistry of stellar evolution (planet formation) occurs before the majority of any type of accepted geological process such as the rock cycle takes place.

Later, it will be shown that this means some (not all) geological formations that were claimed to be intrusive, most likely occurred when the atmosphere was vastly thicker and under many gigapascal of pressure, regardless if that is still considered the "surface" by geologists. This means there are extended types of igneous rocks, rather than just the two types taught, intrusive or extrusive. Put more simply, there wasn't always such a clear boundary of

Earth's rocky surface with the gaseous atmosphere. That surface was not defined earlier in Earth's history, so placing igneous rocks forming under the surface (intrusive) or above surface (extrusive) only will appear myopic in light of understanding Earth at one point was the size of Jupiter as the mantle was forming. In fact, it can even be reasoned that the mantle is still hot in Earth interior because it could not radiate the heat away fast enough before the crust formed. The heat was blocked by the extremely thick atmosphere. No real surface (as we experience it) existed in the middle stages of stellar evolution, so by definition in stellar metamorphosis, magma was "on the surface", regardless if it is considered "lava" by geologists. More will be developed on this later, as it is outside the scope of this paper.

Video on rock cycle being incomplete: https://www.youtube.com/watch?v=kBuBSJkknYQ