Global Scientific JOURNALS

GSJ: Volume 5, Issue 9, September 2017, Online: ISSN 2320-9186
www.globalscientificjournal.com

WHY ATMOSPHERES OF STARS LACK METALS?

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> "Inside this process there is a process of growth and disintegration of elements, which is related to temperature and rotation. The atoms of the lower order are generally present on smaller objects: asteroids, comets and the majority of satellites and smaller planets. When an object's mass is sufficiently increased, given other forces, too, it becomes geologically active. Its temperature grows inside and outside its crust, due to the formation of heated core. The atoms of the higher order are created under these conditions. The more active and warm a planet is, the higher is the presence of the higher order elements. However, at certain point temperature begins to destroy (disintegrate) higher elements.
>
> As temperature gets higher, a variety of elements gets poore„

The topic of this article is evaporation of atoms and compounds inside hot objects.

Strictly speaking, when temperature rises above the point when an atom shifts into the gaseous state, the atom goes into the atmosphere. Atmosphere is the best indicator of a hot object's composition. It is not the case on Earth.

At the bottom of sea or ocean, there are hot spots, where water gets heated far above the boiling point, but water does not evaporate. Heated water gets cooled down fast, as it moves towards the surface. [3] Aerated water, mostly created on the surface layer by heat waves from Sun, goes into the atmosphere.

On the moon of Io, SO_2 from cold volcanoes does not create an atmosphere due to the low temperatures on the surface (minimal surface temperature 90°K, average one is 110°K and maximal one is 130°K) and above the moon's surface. The low temperatures immediately crystallize SO_2 (its boiling point is 263°K, melting point is 201°K) and thus make it return to the moon's surface.[4]

There are elements and compounds inside lava and magma that are incompatible with a liquid state, because their boiling points, as well as the melting points, are higher than the temperatures of lava (SiO_2, MgO, Al_2O_3, TiO_2 etc.).

	Melting point °C	Boiling point °C	% crust of the Earth	% mantle of the Earth		Melting point °C	Boiling point °C	% crust of the Earth	% mantle of the Earth
SiO2	1.713	2.950	60,2	46	**Si**	1.410	2.355	27,7	21,5
Al2O3	2.072	2.977	15,2	4,2	**Al**	660,35	2.467	8,1	2,2
CaO	2.613	2.850	5,5	3,2	**Ca**	839	1484	3,6	2,3
MgO	2.825	3.600	3,1	37,8	**Mg**	648,85	1.090	1,5	22,8
FeO	1.377	3.414	3,8	7,5	**Fe**	1.535	2750	5,0	5,8
Na2O	1.132	1.950	3	0,4	**Na**	97,81	882,95	2,8	0,3
K2O	740	-	2.8	0,04	**K**	63,65	774	2,6	0,03
Fe2O3	1.539 –	Not Available	2.5		**Fe**	1.535	2750		
H2O	0	100	1,4 (1,1)		**H**	-259,14	-252,87		
CO2	-56	Sublimation -78,5	1,2		**O**	-218,35	-182,96	46,6	44,8
TiO2	1.843	2.972	0,7		**Ti**	1.660	3.287		
P2O5	sublimes	360	0,2		**P**	44,15	280 P4		
Sunce	**He** 24,85 %, **H** 73,46%, **O** 0,77%, **C** 0,29%, other 0,53%				**He**	-272,20	-268,934		

Why there are elements and compounds in the melted matter that have boiling and melting points above the temperatures of lava and magma (why there are compounds in lava that have melting points far below the temperature of lava)?

The temperature of lava is from 500°C to 1 600°C („Magmas of komatiitic compositions have a very high melting point, with calculated eruption temperatures in excess of 1600 °C." [5]).

The temperature of mantle is 500 – 900°C, and of the core 4 000°C (the average thickness of mantle is 2 886 km).

If that matter is coming out of core, 2 886 km is by many times enough for it to gets cooled down, especially if a time frame is taken into account (most of the volcanoes are inactive for centuries). High temperatures in the core dissolve the elements with high quantity of protons into the elements with lower quantity of protons (from the table: Fe has 26, Ti 22, K 19, the most commonly found Si has 14 protons (oxygen has 8 protons)).

Complex atoms are created inside the crust of Earth due to the action of different temperatures (between mantle and crust) and pressure. Furthermore, oxides are created by the constant influx of oxygen and carbohydrates by the influx of hydrogen (CH_4, C_xH_x). The compound of oxygen and hydrogen is water, etc.

Lava is mostly created by compounds that are in the solid state on the temperatures of lava

($K Al Si_3 O_8$ - $Na Al Si_3 O_8$ - $Ca Al_2 Si_2 O_8$ (Feldspars), respectively MgO Melting

point 2,825 °C, boiling point 3,600 °C, Al_2O_3 2,072 °C/2,977 °C; SiO_2 1,713 °C/2,950 °C; TiO_2 1,843 °C/ 2,972 °C, CaO 2.613 °C/2886 °C, FeO 1.377 °C/3.414 °C, Na_2O 1132 °C/1.950 °C etc., which is best demonstrated in the presence ratio of the two compound groups:

Anorthosite je $Ca Al_2 Si_2 O_8$. 90-100 /$Na Al Si_3 O_8$ 0-10 via bytovnit 79-90 /30-10 labradorite 50-70 / 50-30, Oligoclase 10-30 / 90-70, albit 0-10 /100-90, or

Basalt generally has a composition of 45–55 wt% SiO_2, 2–6 wt% total alkalis, 0.5–2.0 wt% TiO_2, 5–14 wt% FeO and 14 wt% or more Al_2O_3. Contents of CaO are commonly near 10 wt%, those of MgO commonly in the range 5 to 12 wt%,

Granite: SiO_2 72,04% (silika gel), Al_2O_3 14,42% (glinica), K_2O 4,12%, Na_2O 3,69%, CaO 1,82%, FeO 1,68%, Fe_2O_3 1,22%, MgO 0,71%, TiO_2 0,30%, P_2O_5 0,12%, MnO 0,05% etc.

data are from Wikipedia).

The explanation that granite turns liquid at low temperatures with the pressure of a few atmospheres does not explain why it is in a liquid state in lava at the pressure of one atmosphere.

Volatile elements and compounds (the boiling points of which are below the temperature of lava) evaporate from lava, but, because of low temperatures that are lower (for example, lava is 1 200°C, air is 15°C, melting point of magnesium is 648,85°C and boiling point is 1 090°C; instead of evaporating into atmosphere, magnesium particles get cooled down by low temperatures and they stay on the lava surface (which affects the level of lava viscosity: lower temperatures have smaller quantity of elements and compounds that change their state from liquid into gaseous and vice versa; with the increase of temperature, that quantity increases and viscosity decreases)) and the process goes on until a particle of magnesium becomes a compound of MgO, with the melting point of 2 825°C and boiling point of 3 600°C (or it only stays as Mg, in the process of hardening and cooling down the lava).

Let us have a look at this from the viewpoint of subduction and spreading away of the tectonic plates. If there is a process of creating melted matter by friction in the subduction of plates (convergent boundaries) and the results are volcanoes – then why in the process of spreading away of plates (divergent boundaries) there is melted matter? Two opposite processes create the same outcomes and provide a simple answer: there is melted matter (magma) under ther crust.

I am hereby stopping any further discussion of providing evidence for the process of creating and existing of the oxide compounds, etc., although they (evidence) are almost obvious by themselves, when the comparison of Sun's and Earth's compositions is done.

Sun photospheric composition (by mass)		Melting point °C	Boiling point °C
Hydrogen	73.46%	-259,14	-252,87
Helium	24.85%	-272,20	-268,934
Oxygen	0.77%	-218,35	-182,96
Carbon	0.29%	3.547,00	4.827,00
Iron	0.16%	1.535,00	2.750,00
Neon	0.12%	-248,67	-246,05
Nitrogen	0.09%	-209,86	-195,75
Silicon	0.07%	1.410,00	2.355,00
Magnesium	0.05%	648,85	1.090,00
Sulfur	0.04%	112,85	444,674
Sun, average density 1.408 g/cm³ Temperature photosphere : 5,772 K			

Today, the relation of pressure with density and temperature does not exist, but to the opposite, that the increase of pressure gets matter diluted and density decreases.

The accepted theories (for Sun) suggest that pressure for a matter layer, which is 552.000 km thick, and with the gravity of the object, which mass is ~2 $x10^{30}$ kg, results in the density of 0,2 g/cm^2 (radiative zone), and, as the opposite to this, there is the pressure inside the core of Earth, which is 5.100-6.378 km deep under the surface, and with the gravity of the object, which mass is ~6 x 10^{24} kg, results in the density of 12,8-13,1 g/cm^2. This does not sound convincing and it is not justified by science.

Accepting that:

> Growth doesn't stop with atoms; on the contrary, joining goes on. Through joining, chemical reactions and combined, gas, dust, sand, the rocks named asteroids and comets, etc., are all created. Even further, planets are created the same way. Then, when planets grow to the 10% of Sun's mass, they become stars, which can be really gigantic (super-giants).
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> Millions of craters scattered around the objects of our Solar system are the evidence of objects' growth. Constant impacts of asteroids into our atmosphere and soil are the evidence of these processes being uninterrupted today, just the same as it used to be in any earlier period of the past. It is estimated that 4 000 – 100 000 tons of extraterrestrial material falls yearly to Earth [2]

the processes on and in the stars are similar to the processes on melted planets and other minor objects. Interiority of a star is a mix of matter, which is chemically less diverse (both in quantity and diversity) than lava (magma).

Due to the long-term exposure of more complex atoms and compounds to the temperatures above their boiling points, they get dissolved into atoms of hydrogen, helium, oxygen (~74/24/1/).

M type of stars (fraction of all main-sequence stars 76.45%), due to temperatures of 2 400–3 700°K can have on their surfaces, the majority of oxides, existing in lava nad magma on Earth, are in a liquid state. The expected diversity of chemical compounds will be lower, but the readings of compound presence will be lower, because the layer above a star is colder than the boiling points of atoms and compounds; here they get crystallized and fall on the surface.

Inside stars (melted objects), hot matter constantly tends to move towards the surface, but it gets slowed down by high pressure and rotation in layers, so it gets cooled down.

The hottest place on a star is its center. Matter that is melted above the boiling point moves towards the colder surface and even colder atmosphere. Because of the high temperatures, the photosphere and atmosphere (4 100°K on Sun) should be full of heavy metals, but they are not.

A problem here is that surfaces of a part of stars (F, A, B, O, WR, white dwarfs (Sun 5.500°C, Sirius 9.940°K, WR 2 141.000 , etc.)) are also above the boiling points of atoms; here, the process occurs on the edge of a cold surrounding outside the visible matter. If the cores of stars (Sun...) were created of heavy metals (iron,...), they would have been proportionally represented on the surface and atmosphere of a particular star.

> The claims that there is a radioactive disintegration need to be dismissed as incredible; more than half a million of people live only around Vesuvius in Italy and they are not irradiated. Lava can be hot, but never radioactive (low radiation that exist in the lava is considered that they are not harmful to people and life).

Radioactive elements and compounds are present in the crust of Earth. Lava can go through that matter and demonstrate radioactivity, but that does not provide evidence of magma being radioactive. Plates and volcanoes move.

> The conduct of matter in blast furnaces for melting iron is known; therefore, it is also known that hot mass is dislocating, which means that radioactive elements should be equally present in lava now and 4,5 billion of years earlier – but, they are not "(Ultramafic (picritic): SiO_2 <45%, Fe-Mg> 8% and up to 32% MgO, temperature up to 1500°C))".
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> The mass which creates pressure and the effects of the gravitational forces of Sun are responsible for the melted core. That is the reason why Venus is more warm than Earth and has more active volcanoes, although it is smaller than Earth.
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> Therefore, there are convincing and verifiable evidence for the objects to shine. They start shining when they reach a sufficient mass if they are in a distant orbit or are independent, or when they reach a sufficient mass and the effects of the gravitational forces if they are closer to the central object (the most often, to a star). Earlier, people were taught that for an object to become a star, it would be sufficient to reach 10% of Sun's mass. Now, the ever-improving technology is providing more and more new evidence to change that mass level.[6]