LITthium of issues

Understanding The Controversial Element That Apparently Rules All

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Elon Musk recently called lithium batteries the 'new oil', and rightly so for lithium is being considered as a crucial turning point in the energy sector. From powering electric vehicles to air conditioners, the element has been in use, and subsequently in news everywhere. The result - surging lithium stocks and a global race to secure this scarce but precious metal. Besides, due credit must be given to the metal that was one of the only three elements created during the Big Bang. Howbeit, even the ones ascending from heaven are not free from world-ly controversy especially when they are the cause of a humanitarian crisis. With lithium being a topic of discussion for its pros as well as its cons, let's have a look at all the facets and see which side we stand on.

What is lithium?

- Lithium is a silvery-white alkali metal.
- It was discovered in 1817 by Swedish chemist Johan August Arfvedson.
- It is highly reactive and flammable, which is why it is stored in vacuum or inert liquid like purified kerosene or mineral oil.
- Denoted by 'Li' and having the atomic number of three, it derives its name from the Greek word 'lithos', meaning 'stone'.
- Lithium is the least dense solid element, with an affinity for corrosion.
- It is not abundantly available in nature but is usually found in pegmatitic minerals. Due to its solubility, it can be found in ocean water as brines.
- Countries like Chile, Australia, Argentina, China, and Russia have the highest production of lithium.

Why is it used?

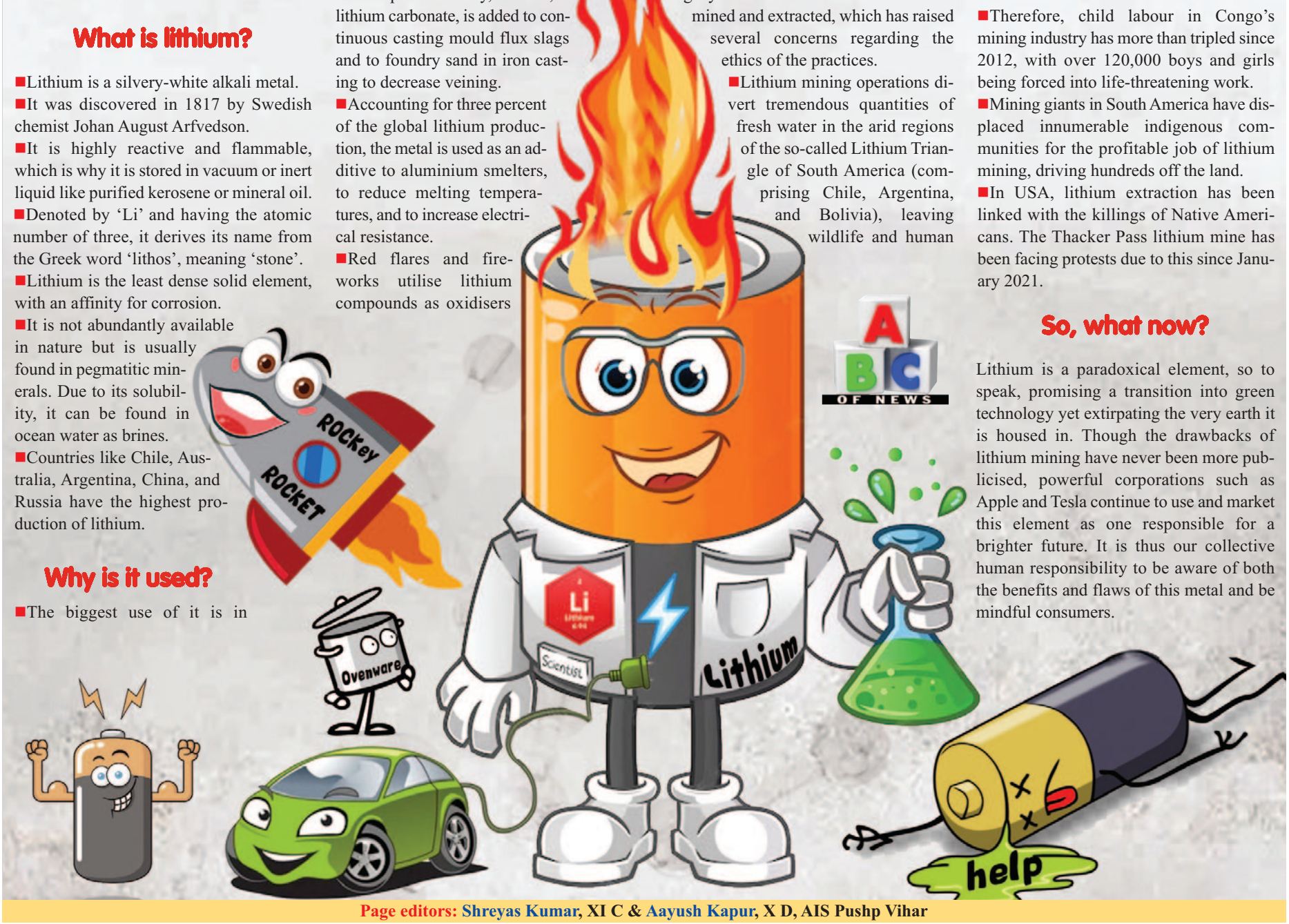
- The biggest use of it is in chargeable batteries as they are characterised by higher specific energy, density, efficiency, and a longer life cycle, which is why they are found in smartphones, laptops, electric vehicles, and various other chargeable items.
- Lithium oxide is used to produce silica (used in ovenware) where it helps in reducing the melting point and viscosity of the material, creating glazes with improved physical properties and heat resistance.
- Metallic lithium and its complex hydrides are used as high-energy additives in military sector to rocket propellants. Lithium aluminium hydride is used as a rocket fuel and various other hydrides of lithium are further used in thermonuclear weapons.
- Lithium fluoride, a transparent material, is often used in optics for infrared and ultraviolet applications.
- To improve fluidity, lithium, as lithium carbonate, is added to continuous casting mould flux slags and to foundry sand in iron casting to decrease veining.
- Accounting for three percent of the global lithium production, the metal is used as an additive to aluminium smelters, to reduce melting temperatures, and to increase electrical resistance.
- Red flares and fireworks utilise lithium compounds as oxidisers and pyrotechnic colouring agents.
- Organolithium compounds are used in the production of polymers as catalysts or initiators, and also for the production of fine chemicals as they are strong bases and reagents to facilitate the formation of carbon-carbon bonds.
- Lithium hydroxide and lithium peroxide are used for carbon dioxide removal and air purification in confined areas like spacecrafts and submarines.
- Used to treat depression, schizoaffective disorder, and bipolar disorder, lithium is being experimented with as a potential cure for various serious issues.

How is it evil then?

- Though lithium seems to have multiple uses, the main question on its integrity is raised because of how it is mined and extracted, which has raised several concerns regarding the ethics of the practices.
- Lithium mining operations divert tremendous quantities of fresh water in the arid regions of the so-called Lithium Triangle of South America (comprising Chile, Argentina, and Bolivia), leaving wildlife and human population nearby parched.
- The sulfuric acid and sodium hydroxide, employed in the extraction of lithium, contaminate the soil and water of the area, causing water contamination, respiratory problems, ecosystem degradation, and landscape damage. It takes centuries for the delicate natural equilibrium to recover.
- Its extraction also leads to large amounts of magnesium and lime waste, uranium byproduct, and sulfuric acid discharge.
- The mining, extraction, and its overall production emits more greenhouse gases into the atmosphere than the manufacturing of automobiles that run on fossil fuels.
- The extraction of lithium has created modern-day slavery in nations like Congo and Zimbabwe, where hundreds of thousands of parents have been forced to send their children to hazardous mines for lithium extraction.
- Therefore, child labour in Congo's mining industry has more than tripled since 2012, with over 120,000 boys and girls being forced into life-threatening work.
- Mining giants in South America have displaced innumerable indigenous communities for the profitable job of lithium mining, driving hundreds off the land.
- In USA, lithium extraction has been linked with the killings of Native Americans. The Thacker Pass lithium mine has been facing protests due to this since January 2021.

So, what now?

Lithium is a paradoxical element, so to speak, promising a transition into green technology yet extirpating the very earth it is housed in. Though the drawbacks of lithium mining have never been more publicised, powerful corporations such as Apple and Tesla continue to use and market this element as one responsible for a brighter future. It is thus our collective human responsibility to be aware of both the benefits and flaws of this metal and be mindful consumers.



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