Steel And Iron Waste Management

Posted on October 3, 2019

Introduction

Steel is one of the many metals which can be recycled endlessly without the integrity of the metal being compromised. Iron, on the other hand, has an easier capability to rearrange its atoms when heated. Recycling of these metals began as early as the 19th century when new steel products were made from melting scrap metal. Scrap metal is now a raw material used in the steel industry. Steel can be made from iron atoms being alloyed with other elements in the environment. The alloys can be used to make electro-galvanized steel sheets to make vehicle bodies. When recycling this steel, however, flue gas dust emissions can be produced due to the zinc coat melting when exposed to heat. This gas can pose a hazardous risk to life by clogging the lungs (Environmental Impact of the Processes, 2018).

Steel And Iron Recycling

Steel is an iron alloy, and it remains one of the most recycled items, along with the ferrous iron element (ASM Metal Recycling Ltd, 2018). Iron, as a metal, can be recycled using five key methods that involve;

- Sorting – this is done by passing a magnetic field over the metal elements and capturing the magnetic ones. Steel and iron are magnetic elements which can be sorted by using magnets.
- Shredding – which involves the use of magnetic drums that are fitted as propellers and kept rotating to extract magnetic elements from a mixture of metals
- Media separation that involves high-pressure air flows working in hand with electrical currents and floating systems. This method can be used to separate other alloys that are mixed with steel, removing the protective layer most steel products have.
- Shearing – that involves the use of machines which cut heavy pieces of steel using hydraulic pressure. The cut pieces of steel have been used to make railway lines, adding to the many ways in which recycled steel can be used.
- Baling – that involves compressing iron and steel into one large block that can be moved easily at a cheaper cost than when the metals were on their own.

Different methods of recycling steel and iron are currently being used in the world. The landfill is the most commonly used method that is utilized by firms to dispose of these metals. Governments find it expensive when they try to separate recyclable metals from unrecyclable ones. They take advantage of the empty land spaces spread out throughout the country to dispose of metals. This is, however, detrimental to the natural state of the earth as it increases pollution levels through the emission of

carbon dioxide gas produced when metals get oxidized. Subgrade filing is also a common method currently used by governments to dispose of recycled slugs, as it is cost-effective and reduces the effects of pollution on the environment. Construction materials are also known to be utilized by farmers to improve soil fertility by scattering materials across a firm. Scientists have also found new ways to utilize industrial waste to make water-purifying agents which can be used to treat sewage. The slags can be ground into powder form, which can be used to absorb the minerals found in water.

The Future Of Industrial Waste Management

The Rapid increase in industrial manufacturing and processing in the business world has both a positive and negative impact on the environment and the general population. As stated earlier, the negative impacts of iron and steel processing include environmental pollution. Pollution has adverse effects on the environment and people, which include water contamination, cancer, air pollution, etc. Steel is an alloy of iron and carbon, making this discussion basically about the recycling of iron (Sverdrup et al., 2017).

For Australia, a bigger threat lies in the fact that China has closed its doors to the country's garbage materials, leading to a dire need for Australia to invest in recycling. Existent methods of dealing with the waste, e.g., landfills and burning, present just but a short-term solution to the problem. This is because, with time, all Australian land available for filling will not last long before all of it is consumed by waste. Burning also presents an adverse side effect, which is air pollution, which leads to ozone depletion, hence global warming, plant deterioration due to blockage of stomata as well as contaminated air due to exposure to harmful oxides. Recycling of steel and iron slag, dross, and scaling present in itself a great investment opportunity, both financially and regarding environmental protection.

According to Dr. John Collins, the landfill method of handling waste could be advanced shortly by the introduction of genetically engineered slugs, which, as proposed, will be capable of chewing through landfills. Dr. Collins believes that revolutionary cell biology will enable the creation of synthetic biocatalysts to digest waste and convert it to useful products. (Eandt.theiet.org, 2018). This method is not only a great possible advancement in landfilling methods but also is applicable, theoretically, in mining. The technology known as CRISPR-Cas9 has been described by the involved scientists as the most precise and versatile method of genome editing ever developed. The project, under SynbiCITE, if adopted in recycling, will advance recycling miles away from where it lies today. All the same, the method has some controversy, which Prof. Dietram Scheufele calls "potential pitfalls." One is that it could be used in unethical means in the military to create viruses that could be inhaled to create genetic mutations causing cancer.

Conclusion

In conclusion, improper management of waste can cause great negative effects on the environment, yet proper management can be used to reduce the same negative effects. To maintain a balance in the ecosystem, biocatalysts have been invented to reduce the mass of landfills which have been disposed of. This will reduce the space occupied by these landfills, freeing more spaces of land that can be utilized for other purposes by the government. Australia has faced bans from China on their disposal of industrial waste to their country. Australia can choose the best feasible solution for its waste management to curb any future problems that could arise from the dumping of this waste.

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