Carbon Emission Reduction in Steel Recycling

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Abstract

Steel is essential to build and maintain the modern world. However, producing steel involves burning large sums of coal or oil. Fossil fuels like these releases carbon into the atmosphere that was not part of the biosphere; which leads to climate change. Burning wood releases carbon that was already part of the biosphere which means no additional climate change. **This project will explore the possibility of using wood as an energy source to melt steel.**

Figure 1. The second iteration of the charcoal powered blast furnace.

Methods

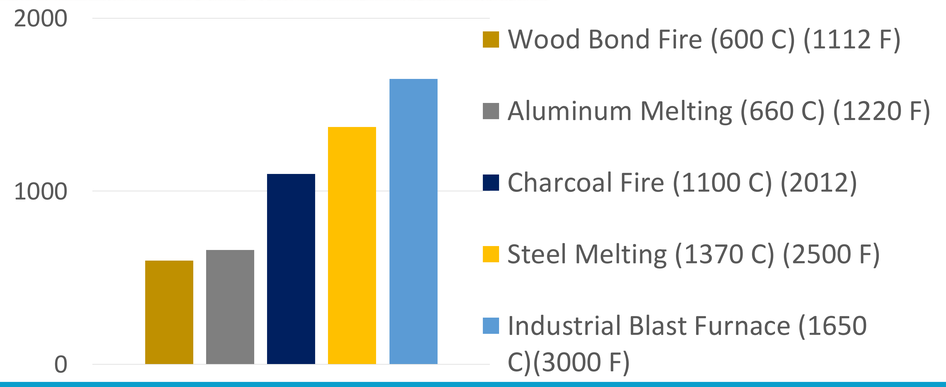
1. Design Current Iteration From Previously Collected Data
2. Obtain Clay From Ground
3. Create Brick Form
4. Form Heat Resistant Bricks, Form Heat Resistant Mortar
5. Obtain Metallic Components
6. Obtain Air Pump
7. Assemble Blast Furnace
8. Obtain Wood Fuel
9. Run Furnace for Finalization
10. Testing and Adjusting, Collect Data
11. Design the Next Iteration

Results

Figure 2. Side view of blast furnace with wood chamber on left and crucible chamber on right. An air intake tube is attached to the top of the wood chamber.

Figure 3. Aluminum ingots created by melting aluminum and pouring it into muffin mold.

Figure 4. A close-up of a stainless-steel crucible containing molten aluminum. This crucible is within the right chamber of the furnace.



Conclusion

The objective of this project was to see whether firewood could be used to melt steel. Results show that the wood pyrolysis in the blast furnace can melt aluminum. This means that the exhaust is over 660 degrees Celsius. In future experiments, new blast furnace configurations will be tested to see if firewood can melt steel.

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