**The Team**

2017 AIChE Cooper Union Student Chapter Chem-E-Car Team
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**Operation**

\[\text{MgCO}_3 (aq) + C_6H_8O_7 (aq) \rightarrow C_6H_6MgO_7 (aq) + H_2O (l) + \text{CO}_2 (g)\]

- Powered by pressurized CO\(_2\).
- Ratio of reactants and water (added to promote mixing) optimized through testing.
- Distance traveled controlled by reactant quantity.
- Car stops when CO\(_2\) is used up and Lego engine stops running.

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**50% ORGANIC LEMON AID**

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**The Car**

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**Distance Calibration**

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**Process Diagram**

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**Unique Features**

- **Lego Pneumatic Engine**
  - Runs on pressurized CO\(_2\)
  - 4 pistons
  - Easy to clean, plastic MOC will not corrode
  - Lightweight

- **Gym Chalk & Citric Acid**
  - Household chemicals, easily procured
  - Affordable
  - Safe to utilize, NFPA rating of 0 or 1 in all categories

- **Custom frame**
  - Lightweight and resilient
  - Precise fitting of components

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**EHS Considerations**

- **Environment**
  - Low carbon dioxide emissions

- **Health**
  - Low toxicity chemicals

- **Safety**
  - Pressure regulator allows for safe, consistent engine operation
  - Relief valves installed on reaction vessel and after regulator
  - Lever valve for emergency stop
  - All components selected for MAOP service & chemical compatibility
  - Gauges read 2x the max operating pressure