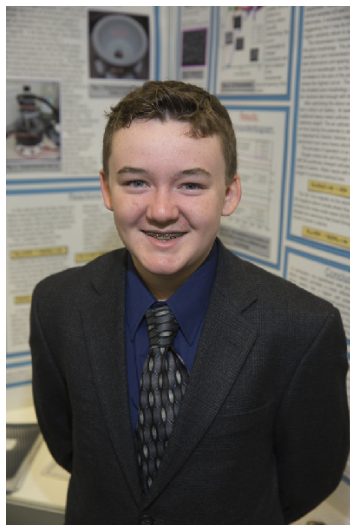


## CWSF 2016 - Montreal, Quebec



### Nicolaas Doyle

#### Microporous Silicon as an Alternative Battery Anode

**Challenge:** Energy

**Category:** Intermediate

**Region:** Niagara

**City:** Grimsy, ON

**School:** Grimsby S.S.

**Abstract:** Batteries are important as storage for renewable energy. Li batteries have detracting issues. Silicon is proposed as an alternative battery anode because it is safe, has high energy capacity, and is abundant in the Earth's crust. Using Silicon with an alkaline electrolyte causes an oxide coating. To address this I investigate the effect of electrochemically etching micropores to improve its effectiveness as an anode.

#### Biography

My name is Nicolaas Doyle and I come from Grimsby Ontario. I am in Grade 10 at Grimsby Secondary School. In my spare time I enjoy swimming, biking, playing the saxophone, and racing remote controlled (RC) cars. Picking a topic that interests you is key to a successful project. Through my interest and involvement in RC car racing, I realized that batteries can be a key advantage when developed and used properly. So this year I wanted to do something in the battery research field. By reading research articles, I found that air batteries are at the forefront of future technology, however the cathode that lets oxygen through, and keeps the electrolyte from leaking out is difficult to make. So I decided to work on the other side of the battery, the anode. Again, through research I found that silicon has been introduced as an alternative anode due to safety aspects and abundance, but in use develops a surface oxide layer limiting its lifetime. Therefore I decided to do my project this year on investigating possible solutions to this issue. In the future I would like to develop an air battery using porous silicon as an anode.

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