

## APPENDIX

FIGURE 1: Carbon dioxide growth from 1958 until 2014 at Scripp's Mauna Loa Observatory.

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FIGURE 2: Carbon dioxide Emissions from Fuel Combustion (2012), International Energy Agency.

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Many thanks again and wishing you best of luck with your dissertation,

Eleonor

## APPENDIX (continued)

FIGURE 3: Specific energy densities of different Lithium-ions batteries relative to the electrodes materials (www.batteryuniversity.com)

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## APPENDIX (continued)

FIGURE 4: Theoretical and real energy densities of some kind of batteries compared to the gasoline energy density.

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**Title:** Lithium–Air Battery: Promise and Challenges

**Author:** G. Girishkumar, B. McCloskey, A. C. Luntz, et al

**Publication:** Journal of Physical Chemistry Letters

**Publisher:** American Chemical Society

**Date:** Jul 1, 2010

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FIGURE 5: Example of stability of a Lithium-air battery from cycle to cycle.

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FIGURE 6: Example of stability of a Lithium-ions battery from cycle to cycle.



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FIGURE 10: The main active materials specific energies and energy densities.

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Figure 2. (a) specific energy and (b) density values based on active materials alone for selected Li-air active materials, and an insertion reaction for comparison

JES 159 (2) R1-R30 (2012)

Signature: Marc Gerard Date: 01/12/2016

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FIGURE 12: Example of cycle-ability in a Lithium-air battery



**Title:** A lithium-oxygen battery based on lithium superoxide

**Author:** Jun Lu, Yun Jung Lee, Xiangyi Luo, Kah Chun Lau, Mohammad Asadi, Hsien-Hau Wang

**Publication:** Nature

**Publisher:** Nature Publishing Group

**Date:** Jan 11, 2016

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FIGURE 13: Viscosity of different ILs

FIGURE 14: Conductivity of different ILs

**Dr. Frank Stiemke**

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## APPENDIX (continued)

FIGURE 15: Chemical structure of the MoS<sub>2</sub>

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## APPENDIX (continued)

FIGURE 9: Scheme of the cell

FIGURE 16: Cyclic-Voltammetry test using MoS<sub>2</sub> as a catalyst with Oxygen and Argon

FIGURE 17: Current densities in the cathode led by different catalysts

FIGURE 18: Mechanical interaction with the MoS<sub>2</sub>, the Oxygen and the Ionic Liquid

FIGURE 19: Charge and discharge battery performances with a 500 mAh=gr limited capacity test at a current rate of 1000 mA=gr. 50 cycles test

FIGURE 20: Cathode XRD analysis before and after discharge

