Li-air, rechargeable, solid-state batteries using graphene and boron nitride aerogel matrices. ONUR ERGEN, THANG THOAN PHAM, SALLY DEMAIO-TURNER, ALEX ZETTL, University of California at Berkeley — The recent explosion of research on Li-Air batteries has provided new insights into developing more efficient air cathodes. Graphene and boron nitride aerogel matrix is anticipated to be an ideal candidate to produce a high throughput air-breathing system. We developed a Li-Air battery model that accounts for efficient O₂ throughput. These unique aerogel matrices exhibit the ability to orient the O₂ passing through and keep out H₂O, CO₂, and N₂. Thus, the solid-state cells demonstrate a long cycle life, thermal stability, and high rechargeable characteristics. These cells also show an explicit discharge capacity with a constant discharge current density of 0.1mA/cm².

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Date submitted: 22 Jan 2016 Electronic form version 1.4