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Li-air, rechargeable, solid-state batteries using graphene and boron nitride aerogel matrices.[1] 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 O_2 throughput. These unique aerogel matrices exhibit the ability to orient the O_2 passing through and keep out H_2O, CO_2, and N_2. 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 $0.1 mA/cm^2$.

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