

BAB 5

KESIMPULAN

5.1 Kesimpulan

Kesimpulan yang diperoleh dari penelitian ini adalah sebagai berikut:

1. Rasio massa *hydrochar* dengan zat pengaktif KOH yang semakin besar menghasilkan perolehan massa karbon yang semakin rendah. Karbon aktif yang dihasilkan lebih berpori namun menghasilkan diameter pori yang lebih besar pada permukaan akibat degradasi dinding antar pori karbon aktif. Struktur karbon aktif yang dihasilkan berupa struktur *amorf*.
2. Rasio massa *hydrochar* dengan zat pengaktif H₃PO₄ yang semakin besar menghasilkan perolehan massa karbon yang semakin rendah. Rasio yang terlalu kecil tidak mampu menghasilkan struktur karbon yang berpori. Struktur karbon aktif yang dihasilkan berupa struktur *amorf*.
3. Penggunaan zat pengaktif KOH menghasilkan perolehan massa yang lebih rendah sebesar 25,520 – 36,759%, struktur karbon yang lebih berpori dan *amorf* dibandingkan zat pengaktif H₃PO₄, sehingga dapat diindikasikan bahwa zat pengaktif KOH lebih baik dalam sintesis komposit karbon sulfur berdasarkan analisis SEM/EDX dan XRD. Untuk mengetahui lebih lanjut kemampuan karbon aktif guna sintesis komposit karbon sulfur dalam aplikasi katoda pada baterai litium sulfur, maka perlu menunggu hasil analisis BET mengenai luas permukaan dan volume pori.
4. Komposit karbon sulfur yang dihasilkan dari karbon aktif HAC-K4 memiliki struktur kristalin ditandai dengan puncak-puncak tajam yang menyerupai struktur sulfur akibat rasio penambahan sulfur yang terlalu besar sehingga komposisi sulfur dalam komposit karbon sulfur perlu dioptimalkan.

5.2 Saran

Saran yang dapat diberikan untuk penelitian selanjutnya adalah sebagai berikut:

1. Perlu dilakukan penelitian mengenai pengaruh variasi temperatur terhadap penggunaan zat pengaktif KOH dan H₃PO₄ pada karbon aktif yang dihasilkan.
2. Perlu dilakukan analisis BET atau analisis adsorpsi metilen biru pada karbon aktif untuk mengetahui luas permukaan dan volume pori serta *Raman Spectroscopy* untuk mengetahui kecacatan dan ketidakteraturan struktur karbon.

3. Perlu dilakukan variasi penelitian mengenai rasio penambahan sulfur ke dalam karbon aktif untuk mengoptimalkan sulfur dalam pori-pori karbon aktif.
4. Perlu dilakukan analisis SEM pada komposit karbon sulfur untuk mengetahui morfologi struktur karbon setelah difusi lebur menggunakan sulfur.

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