

BAB 5

KESIMPULAN DAN SARAN

5.1.Kesimpulan

Berdasarkan percobaan yang telah dilakukan, dapat disimpulkan bahwa :

1. Jenis *impregnant*, rasio biomassa terhadap *impregnant*, dan temperatur karbonisasi berpengaruh terhadap karakteristik luas permukaan dan pori-pori karbon aktif.
2. Luas permukaan dan volume pori-pori terbesar diperoleh pada aktivasi ZnCl_2 dengan rasio 1:4 temperatur 600°C , yaitu sebesar $1198,17 \text{ m}^2/\text{g}$ dan $1,062 \text{ cm}^3/\text{g}$.
3. Modifikasi karbon aktif dari kulit jeruk menggunakan asam sulfat 98% dan hidrogen peroksida 35% meningkatkan luas permukaan dan volume pori-pori, sementara asam ntrat 65% memberikan penurunan luas 25,3%, volume pori 26,7%
4. Modifikasi karbon aktif memberikan peningkatan kapasitansi pada awal uji CV, akan tetapi dengan meningkatnya *scan rate*, performansinya menjadi tidak stabil
5. Modifikasi karbon aktif memberikan peningkatan kapasitansi sel pada awal pengujian siklus (GCD) sebesar 113,48% untuk modifikasi asam nitrat, 65,37% hidrogen peroksida, dan 34,48% asam sulfat, tetapi memberikan performansi yang tidak stabil selama pengujian 30 siklus
6. Gugus fungsi oksigen pada karbon aktif memiliki peranan yang lebih besar terhadap kapasitansi dan performansi sel, sekalipun terjadi penurunan luas permukaan pada karbon aktif
7. Karbon aktif dari kulit jeruk tanpa perlakuan memberikan performansi yang stabil dengan nilai kapasitansi awal $56,3 \text{ F/g}$, dengan penurunan hanya sebesar 1,9% setelah 30 siklus, pada pengujian dengan elektrolit LiPF_6 1 M

(EC:EMC:DMC 1:1:1 v/v), rentang tegangan operasi 2,5-4 V, dan arus 3 mA/g.

5.2. Saran

Berdasarkan percobaan yang telah dilakukan, dapat disarankan untuk :

1. Pembuatan karbon aktif dengan *impregnant* KOH perlu dilakukan prekarbonisasi terlebih dahulu, dan karbonisasi dilakukan pada temperatur di kisaran 750°C.
2. Pada penyusunan sel uji, jumlah elektrolit yang digunakan perlu diperhatikan, sehingga tidak terlalu sedikit, atau pun terlalu banyak yang dapat menyebabkan *flooding*
3. Kondisi katoda karbon aktif sebelum dan setelah dilakukan uji siklus perlu diuji sehingga dapat diketahui perubahan apa yang terjadi setelah dilakukan uji siklus.
4. Pengujian sel sebaiknya dilakukan langsung setelah dibuat, tanpa jeda, karena dapat mempengaruhi performansinya.

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