Studi pengaruh fraksi volume penguat nano tembaga (Cu NANO) terhadap sifat mekanis dan konduktivitas listrik pelat bipolar berbasis hybrid nano komposit PP/C - CNT - Cu Nano = Study of influences of addition of volume fraction of nano copper reinforcement to mechanical properties and electrical conductivity of bipolar plate based of hybrid nano composite PP/C-CNT-Cu Nano

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Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh fraksi volume penguat nano tembaga (Cu nano) terhadap konduktivitas listrik dan sifat mekanis pelat bipolar berbasis hybrid nano komposit PP/C-CNT-Cu Nano. Penguat nano tembaga ditambahkan dalam tiga variasi formula sebesar 0.5%wt, 1.0%wt, dan 2.0%wt. Karakterisasi sampel meliputi meliputi pengujian konduktivitas listrik, kekuatan tarik, kekuatan tekuk, densitas, porositas, dan karakteristik patahan tekuk dengan Scanning Electron Microscope (SEM). Dari hasil pengujian tersebut, didapatkan bahwa sifat mekanis dan konduktivitas listrik pelat bipolar akan semakin menurun dengan penambahan penguat nano tembaga. Konduktivitas listrik dan sifat mekanis terbaik terdapat pada formula dengan persentase penguat nano tembaga sebesar 0.5 %wt.
<hr>The objective of this research is to understand the influences of volume fraction of nano copper to the electrical conductivity properties and the mechanical properties of bipolar plate based of hybrid nano composite PP/C-CNT-Cu Nano. Nano copper reinforcement is added to three different formulas which are 0,5wt%; 1,0wt%; and 2,0wt%. The material characterizations including electrical conductivity testing, tensile testing, flexural testing, density testing, porosity testing and characterization of morfologi of flexural fracture using Scanning Electron Microscope (SEM). The result testings show that increasing the volume fraction of nano copper causes decreasing of the mechanical properties and the electrical conductivity properties of bipolar plate. The highest electrical conductivity and mechanical properties is the second formula which is added 0,5 wt% of nano copper reinforcement.