

Pemilihan material elektroda elektrolizer tipe alkalin dan penempatan material lokal dengan metode ASHBY-SAATY = Material selection for alkaline type electrolyzer electrode and local material positioning with ASHBY-Saaty method

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Abstrak

[ABSTRAK

Penelitian energi baru terbarukan, khususnya PEM fuelcell, diiringi dengan penelitian untuk penyediaan bahan bakarnya. Teknologi pembangkit hydrogen sebagai bahan bakar PEMFC (elektrolizer) kembali ke teknologi dasar yaitu Alkaline Elektrolisis. Pengembangan elektroda sebagai komponen utama elektrolizer menggunakan material selama ini dilakukan secara terurut berdasarkan penelitian sebelumnya dan trial and error.

Telah dilakukan pemilihan material elektroda elektrolizer dengan melibatkan kriteria-kriteria yang lain, bukan hanya kinerja material, tetapi juga kriteria biaya material, biaya proses dan bentuk elektroda. Selain itu juga ditambahkan kriteria material lokal sebagai keunggulan untuk sumber daya material Indonesia.

Metode yang dilakukan berdasarkan pendekatan Ashby-Saaty. Tahap pertama dilakukan penilaian keunggulan kriteria yang satu dengan kriteria yang lain. Pada tahap ini, hasil penilaian menunjukkan Material lokal dan Biaya Material menjadi pilihan utama dibandingkan kriteria yang lain. Tahap kedua penilaian dilakukan terhadap 10 kandidat material yang antara lain Platinum, Nikel, Tembaga, Titanium, Cobalt, Molibden, Emas, Perak, Stainless Steel dan Grafit. Penilaian dilakukan melalui sifat properties material terhadap keenam kriteria terkait. Tahap Ketiga merupakan penilaian akhir dimana penilaian kandidat material dibandingkan dengan penilaian kriteriakriteria terkait. Hasil akhir menunjukkan Indonesia memiliki 3 material yang memiliki posisi teratas dalam pemilihan material untuk elektroda yaitu Nikel, Tembaga dan Stainless Steel.

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ABSTRACT

Renewable energy research, especially PEM Fuel Cell, followed by research to fuel resources Hydrogen generation technologies (electrolyzer) as PEMFC fuel back to the basic technology is Alkaline Electrolysis. Development electrodes electrolyzer as main component using materials that have been developed in order based on previous research and trial and error

Have done electrode electrolyzer material selection involving other criteria, not just the material performance, but also the criteria of material costs, the cost of the process and the form of the electrodes. It also added the criteria of local materials as resource material advantages for Indonesia.

The first stage assessment of the excellence criteria with other criteria. At this stage, the assessment results indicate local materials and material costs become the primary choice than other criteria. The second stage of the assessment conducted 10 candidate materials include Platinum, Nickel, Copper, Titanium, Cobalt, Molybden, Gold, Silver, Stainless Steel and Graphite. Assessment comparing one criteria with other criteria as cost of materials, performance, shape, cost of manufacturing and local materials resources. The third stage is the final assessment where the result from 2 stage before compiled and scored. So the last result showing Indonesia has 3 potential material for electrode which is Nickel, Copper and Stainless Steel.;Renewable energy research, especially PEM Fuel Cell, followed by research to fuel resources Hydrogen generation technologies (electrolyzer) as PEMFC fuel back to the basic technology is Alkaline Electrolysis. Development electrodes electrolyzer as main component using materials that have been developed in order based on previous research and trial and error

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