

Studi sifat korosi material magnet permanen Nd-Fe-B

Fatmawaty, author

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Abstrak

ABSTRAK

Korosi adalah kerusakan material yang disebabkan oleh reaksi materi dengan lingkungannya. Dalam penelitian ini telah dilakukan analisis sifat korosi material magnet Nd-Fe-B dalam larutan HCl, NaCl dan NaOH (korosi basah.) dan pemanasan 100°C serta dalam udara terbuka -30°C (korosi kering). Preparasi sampel dilakukan dengan proses metalurgi serbuk dengan komposisi nominal Nd₁₅₊,Fe_xB₈ x = 0; x = 1; x = 3; x = 5. Laju korosi dihitung dengan metode kehilangan berat selama proses. Laju korosi yang tertinggi diamati jika material berada dalam larutan HCl kemudian diikuti oleh NaCl dan NaOH. Hasil identifikasi dengan sinar-x dan SEM/EDX menunjukkan bahwa setelah korosi terbentuk fasa BFe₃, α-Fe serta oksida dari Nd dan Fe. Disamping itu serangan korosi yang terjadi adalah korosi batas butir.

ABSTRACT

Corrosion is a material damage which is caused by the reaction with its environment. In this research some analysis's on the corrosion behavior of magnetic material Nd-Fe-B in HCl, NaCl and NaOH solutions (wet corrosion) and heating to 100°C and in open air -30°C (dry corrosion) have been conducted. The sample preparations were done with powder metallurgy process with the nominal composition of (Nd₁₅ xFe_xB₈), x = 0; x = 1; x = 3; x = 5. The corrosion study was done by evaluating the rate of corrosion with loss of the mass during the reaction method. The highest corrosion rate was in HCl solution and followed by NaCl and NaOH. The phase identification by X-ray result and SEM/EDX, showed that after the corrosion there was a phase change with the formed α-Fe, BFe₃ and the oxide phase out of Nd and Fe. Besides that the other corrosion that occurred was the grain boundary corrosion.