



INTISARI

Tegangan Tinggi memegang peranan penting dalam operasi ketenaga listrik khususnya efisiensi jaringan. Akan tetapi dalam penerapannya, tegangan tinggi menimbulkan masalah-masalah baru, salah satu diantaranya adalah lucutan korona. Korona memiliki dampak negatif terhadap jaringan seperti rugi-rugi daya, interferensi elektromagnetik, dan memperpendek umur isolator dan telah menjadi salah satu faktor yang masuk dalam pertimbangan dalam mendesain suatu jaringan tenaga listrik

Skripsi ini menggambarkan perubahan komposisi permukaan dan senyawa kimia bahan keramik yang diakibatkan paparan korona. Pada penelitian ini, korona dihasilkan oleh pembangkit korona *single needle plane*. Korona dipaparkan pada bahan keramik dalam beberapa rentang waktu yang berbeda. Setelah mengalami paparan, struktur kimia dan morfologi pada permukaan bahan dianalisis menggunakan teknik *Fourier Transform Infrared* (FTIR) dan *Scanning Electron Microscope – Energy Dispersive Ray* (SEM-EDS).

Hasil analisis FTIR berupa gelombang spektrum inframerah yang menunjukkan terjadinya reaksi oksidasi pada semua bahan keramik yang telah dipapar korona yang mengakibatkan penurunan kualitas *hydrophobic* bahan, sehingga bahan lebih mudah menyerap air sehingga menyebabkan penurunan kualitas isolasi. Hasil SEM-EDS juga menunjukkan hasil yang sama disertai dengan gambaran permukaan bahan keramik dengan perbesaran pada level mikroskopi dan tabel komposisi kimia senyawa setelah mengalami oksidasi.

Kata Kunci — isolator, keramik, korona, FTIR, SEM-EDS



ABSTRAK

High voltage plays an important role in power system operation, mostly in efficiency issues. However in practice, high voltage raises some new problems, one of them is corona discharge. Corona discharge leads some negative impacts such as power losses, electromagnetic interference, and lifespan shortening of insulator. Corona issues has become important consideration in designing of high voltage transmission lines.

This paper describes the changes of the surface composition and chemical compounds on ceramic materials caused by corona exposure. In this study, corona was produced by a corona generator of single-needle-plane configuration. Corona was exposed to material for several different times. After that, the chemical and morphological structures on the material's surface were analysed using Fourier Transform Infrared (FTIR) and Scanning Electron-Microscope – Energy Dispersive Ray (SEM-EDS) techniques.

The result of the FTIR analysis was infrared spectrum waves, demonstrating that there was an oxidation reaction on all ceramic materials which have been exposed to corona, thus causing a decrease in the hydrophobic quality of the materials. As a consequence, it was easier for the ceramic materials to absorb water that further results in a decrease in the quality of isolation. In addition, the result of the SEM-EDS analysis also complied with the previous analysis, accompanied by images of the ceramic material's surface magnified on a microscopic level and a table showing the composition of chemical compounds after the oxidation.

Keywords — *insulator, ceramik, corona, FTIR, SEM-EDS*