Comments on `The temperature dependence of homogeneous field breakdown in synthetic air' by W.S. Zaengl et al

McAllister, Iain Wilson

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The Townsend was introduced by gas-discharge physicists [1, 2] who prefer to employ the gas number density $N$ when referring to the energy related parameter $E/N$ rather than $E/p$, where $p$ is the gas pressure at temperature $T$, and $E$ the electric field strength.

With reference to electrical insulation, it may be argued that, on grounds of its magnitude, the Townsend is an impractical unit. In addition, $p$ and $T$ remain the measured variables from which the corresponding $N$ is deduced via the ideal gas law. If however, the gas in question is non-ideal, e.g. SF$_6$, the evaluation of $N$ also requires a knowledge of the gas compressibility factor $Z(p, T)$, $Z \leq 1$. Values of $Z$ can be derived if the relevant virial coefficients are known.

REFERENCES


I. W. McAllister