ABSTRAK

PENGUKURAN SUHU NOL MUTLAK BERDASAR HUKUM GAY LUSSAC

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Telah dilakukan penelitian mengenai pengukuran suhu nol mutlak berdasar Hukum Gay Lussac. Hukum Gay Lussac menyatakan jika volume gas pada sistem tertutup dibuat konstan, maka tekanan gas berbanding lurus dengan suhu gas. Apabila suhu gas semakin tinggi maka tekanan gas akan semakin besar demikian juga sebaliknya. Dalam penelitian ini, pengukuran suhu gas dan tekanan gas dilakukan dengan menggunakan sensor suhu dan sensor tekanan pada sistem tertutup yang dipanaskan. Melalui pengukuran, perubahan suhu gas mengakibatkan perubahan tekanan gas sehingga diperoleh hubungan tekanan gas terhadap suhu gas. Suhu nol mutlak tidak secara langsung dapat diperoleh melalui pengukuran. Hasil pengukuran suhu gas dan tekanan gas dianalisis melalui perhitungan sehingga diperoleh nilai suhu nol mutlak. Analisis grafik menggunakan aplikasi *Logger Pro.*

Nilai suhu nol mutlak yang diperoleh melalui percobaan menggunakan satu labu erlenmeyer yang dianalisis dengan persamaan Hukum Gay Lussac adalah (- 322 ± 2 °C), dengan memperhitungkan nilai suhu ruangan adalah (- 310 ± 1 °C). Nilai yang diperoleh dari pengukuran suhu nol mutlak menggunakan dua labu erlenmeyer sangatlah besar, hal ini dipengaruhi oleh ketidakseragaman suhu di dalam sistem. Melalui percobaan dapat ditunjukkan bahwa dengan memperhitungkan nilai suhu ruangan dapat menghasilkan nilai suhu nol mutlak yang lebih mendekati nilai secara teori.

Kata kunci ; suhu nol mutlak, hukum Gay Lussac, sensor suhu, dan sensor tekanan.

ABSTRACT

MEASUREMENT ABSOLUTE ZERO TEMPERATURE

BASED ON GAY LUSSAC LAW

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Research has been done on absolute zero temperature measurement based on Gay Lussac's Law. Gay Lussac's law states that if the volume of a gas in a closed system is held constant, the pressure of the gas is directly proportional to the temperature of the gas. The higher the gas temperature, the higher the gas pressure and vice versa. In this study, the measurement of gas temperature and gas pressure was carried out using a temperature sensor and a pressure sensor in a heated closed system. Through measurement, changes in gas temperature result in changes in gas pressure so that the relationship between gas pressure and gas temperature is obtained. Absolute zero temperature cannot be directly obtained by measurement. The results of gas temperature and gas pressure measurements were analyzed through calculations so that the absolute zero temperature value was obtained. Graph analysis using the application Logger Pro. The absolute zero temperature value obtained by experiment using an Erlenmeyer flask analyzed by the Gay Lussac's Law equation is (- 322 ± 2 °C), taking into account the room temperature value is (- 310 ± 1 °C). The value obtained from measuring absolute zero temperature using two Erlenmeyer flasks is very large, this is influenced by the temperature uniformity in the system. Through experiments, it can be shown that taking into account the value of room temperature can produce an absolute zero temperature value that is closer to the theoretical value.

Keywords ; absolute zero temperature, Gay Lussac's law, temperature sensor, and pressure sensor.