ANALYSIS OF POSITION ACOUSTIC DETECTOR ON CYLINDRICAL PHOTOACOUSTIC RESONATOR

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Abstract
Cylindrical photoacoustic resonator consisting of azimuthal and longitudinal type with diameters of cavity are 5 mm, 10 mm, and 15 mm have been analyzed. A piezoelectric transducer used as a source of acoustic waves which modulated by a function generator at frequency range 1 kHz to 40 kHz. A microphone was used as a detector with a varying distances at 3 mm, 19 mm, and 35 mm from the piezoelectric transducers for longitudinal resonator. The distance of detector position on azimuthal resonator is 19 mm from the piezoelectric transducers. The result show characteristic frequency of azimuth resonator for 15 mm, 10 mm, and 5 mm are 20 kHz, 14 kHz, and 13 kHz. While, characteristic frequency of longitudinal resonator for diameter 15 mm, 10 mm, and 5 mm are 24 kHz, 25 kHz, and 18 kHz. The detector position at 34 – 35 mm from piezoelectric could detect the maximum acoustic signal.

Key words : Photo-acoustic cell, Resonator, Piezoelectric, Detector