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Fabrication of temperature sensitive hollow micro capsule for the flow visualization SATOSHI SOMEYA, FUMIO TAKEMURA, TETSUO MUNAKATA, National Institute of Advanced Industrial Science and Technology — Temperature and oxygen sensitive hollow micro capsules were fabricated using the bubble template method. The micro bubbles were nucleated in droplets of a dichloromethan solution of polymer. The polymer covered micro bubbles were suspended in aqueous solution. The dichloromethan solution of temperature and oxygen sensitive dye was dissolved into the polymer solution and the temperature and oxygen sensitive dye was incorporated into the capsule shell. Using the bubble template method, large amount of hollow micro capsules could be formed with very high number of density. The diameter of capsules was 1 ~ 3 micro meter and the specific gravity of capsules was 1.01 g/cm³. They seemed to be suitable as tracer particles for the PIV measurement. The temperature sensitivity and the oxygen sensitivity of fluorescence intensity from the functional capsules were measured using a spectrometer. The effect of excitation wavelength on these sensitivities and the quenching due to large excitation intensity were also evaluated. The temperature sensitivity was about -2%/°C and the fluorescence intensity was stable and no quenching was detected in 20 minutes, even under the intense excitation of 1W.

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