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Temperature Sensitive Particle for Velocity and Temperature Measurement. SATOSHI SOMEYA, KOJI OKAMOTO, MASAO IIDA, School of Frontier Science, The University of Tokyo — Phosphorescence and fluorescence are often applied to measure the temperature and the concentration of oxygen. The intensity and the lifetime of phosphor depend on the temperature and the oxygen concentration, due to the quenching effect of the phosphor. The present study clarified the effects of temperature on the lifetime of phosphorescence of Porphyrins, $Ru(bpy)_3^{2+}$ and the europium complex. The phosphorescence lifetime of oil solution / water solution / painted wall were measured with changing temperature and oxygen concentration. In addition, the optical property of the small particles incorporated with the europium complex was investigated in the oil/water. The lifetime was strongly affected by temperature. Then, the temperature sensitive particle (TSParticle) with metal complex was applied to measure temperature in Silicone oil (10cSt) two-dimensionally. Present study is the result of ?High speed three-dimensional direct measurement technology development for the evaluation of heat flux and flow of liquid metal? entrusted to the University of Tokyo by the Ministry of Education, Culture, Sports, Science and Technology of Japan(MEXT).

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