

## Development of microfluidic device system for the bioluminescent assay of ATP

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$\mu$ -TAS(micro-total analysis system) has increasing concern as an analytical device for various applications. The field of  $\mu$ -TAS is rapidly developing because of its advantages. The simple fabrication techniques based on polymer and soft-lithography enhanced the usages of  $\mu$ -TAS. In this study, the microfluidic device and detector system have been developed for measuring ATP based on bioluminescence. The concentration of ATP was determined by bioluminescent reaction using luciferase and home-made detector system. A serpentine-shape reactor was fabricated in PDMS microfluidic device to enhance the sensitivity of detection. The optimum flow rate of sample and reagent solutions was surveyed. Diffusivities of biomolecules participated in bioluminescent reaction and consumption rate of ATP were considered as major factors affecting the optimum flow rates. The system can be applied for rapid detection of microorganisms and for monitoring of the health of culture.