

**13:00-15:00**  
**Room : C302**

**Chair : Lee In Beum (POSTECH )**  
**Co-Chair : Kwang Suk Book (Inje Univ.)**

**13:00 – 13:20**

**D-FP08-1**

**3 Types of Set Point Controllers for Biological Wastewater Treatment Process**

D. Kim and I.B.Lee  
 (POSTECH)

One of the main problems to constitute control method on biologically oriented wastewater purification processes, e.g. activated sludge process, sequential batch reactor, rotating bio-disk contactor, etc. is that it is hard to control the target component directly. For instance, while biochemical oxygen demand, suspended solids, and chemical oxygen demand are the key components to check the process performance, one may not control them directly since they are the results of microbial activities related to numerous physiochemical factors. Therefore controllers for bioprocess should be designed to make favorable condition for microorganisms' living, e.g. dissolved oxygen level favorable, mixed liquor suspended solids concentration suitable ...

**13:20 – 13:40**

**D-FP08-2**

**Model-on-demand Predictive Control of Polymerization Reactor Systems**

Hur Su-Mi, Park Myung-June, Rhee Hyun-Ku  
 (Seoul National Univ.)

This work is concerned with the improvement of the productivity and the product quality in the polymerization reactors by using model-on-demand predictive control(MoDPC). This technique is applied to a continuous styrene polymerization reactor and a semibatch methyl methacrylate (MMA)/vinyl acetate(VAc) copolymerization reactor. The regress is constructed with the most influential variables ( the conversion and the jacket inlet temperature for the styrene polymerization reactor, and the free volume and the reactor temperature for the MMA/VAc copolymerization reactor) through open loop operations. From the simulation results for setpoint tracking and disturbance rejection problems, it is demonstrated that the MoDPC shows ...

**13:40 – 14:00**

**D-FP08-3**

**State Estimation and Property Control in an MMA/MA Copolymerization Reactor**

Myung-June Park, Su-Mi Hur, Hyun-Ku Rhee  
 (Seoul National Univ.)

An experimental study was performed to establish the validity of an on-line state estimator for a semibatch MMA-MA copolymerization reactor by using on-line densitometer and viscometer under two different operating conditions; one without additional solvent feed and the other with solvent fed additionally. A conventional extended Kalman filter (EKF) was used as the state estimator and the experiment was conducted for the purpose of application to the control of copolymer properties. Further analysis was made by using off-line measurement data for the mole fraction of MMA in the remaining monomers and the solid content. It was found that the EKF could provide a good estimate for the states of the copolymerization system...

**14:00 – 14:20**

**D-FP08-4**

**A Study on Optimization of Megasonic Cleaning Process for Manufacturing LCD**

Young Sook Kim, Hie-Sik Kim, Gi Sang Choi  
 (Univ. of Seoul)

Recently, TFT LCD (thin film transistor liquid crystal display) manufacturing industry is more concerned with the ways of cleaning large TFT LCD's with high fixed density than ever. Ultrasonic cleaners with high frequencies like 1MHz (megasonic cleaners) are effective in removing very small particles without causing mechanical damage to the surface. In this study a megasonic cleaner for TFT LCD manufacturing process is developed and the performance is evaluated through experiments. The experimental results show that the developed megasonic cleaners is effective in removing very small particle from the LCD panel.

**14:20 – 14:40**

**D-FP08-5**

**Development of a User-Friendly Automatic Control System for Electro-Slag Remelting Process**

Tae Gyoon Lim, Chang Woo Reeu, Kwang Suk Boo  
 (Inje Univ.)

This paper presents development of a user-friendly automatic control system for ESR(Electro-Slag Remelting or Refining)process. It is a second-phase refining one, commonly applied to production of high-purity specialty steel. A primarily refined castingot acts as a consumable electrode and melts by the electric resistance heat generated when high current is induced through a slagbath. The quality of product is evaluated by its chemical composition, purity, micro-structure, uniformity, mechanical property, etc. To meet the standards, above all things, the process should be kept sound and the melt rate should track the optimum profile irrespective of environment variations. Current ESR system is manually operated...