

M-Biotech's Hydrogel Swelling Kinetics Monitoring System

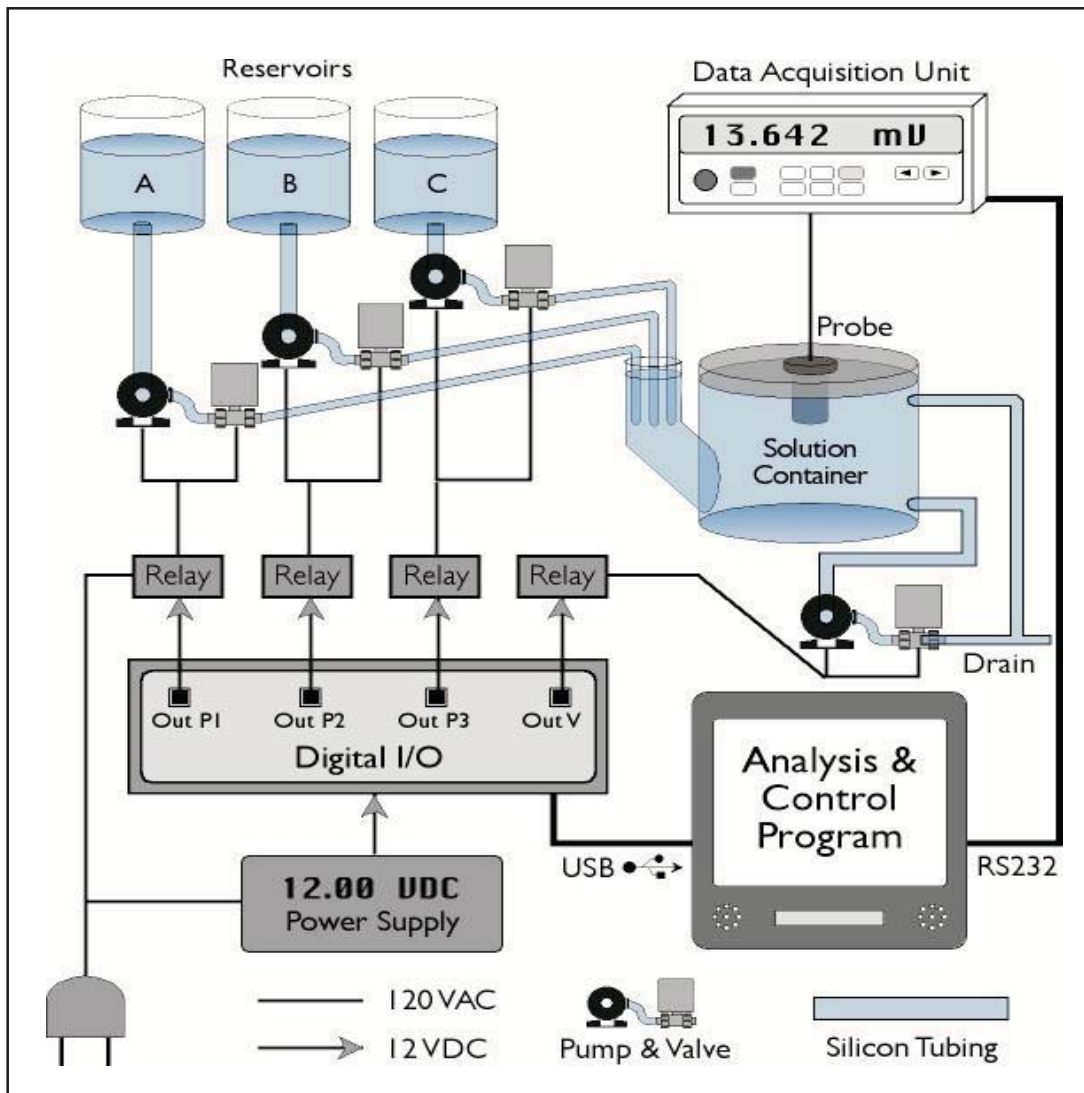
M-Biotech's Hydrogel Swelling Kinetics Monitoring System is a powerful tool for evaluating the characteristics of hydrogel in a precise and time-efficient manner. This system is based on M-Biotech's patented pressure biosensor technology.

Much research attention has been paid to materials that exhibit change in physical and chemical structure in response to external stimuli such as pH, temperature, and analyte concentration. Physical and chemical structure change of hydrogels cause a change in the volume of hydrogel as it absorbs or desorbs water.

Recently, these materials, called intelligent materials, have been focused for use with sensors, actuators, and drug delivery systems. Hydrogel researchers are mainly interested in the degree of responsiveness (volume change) to external stimuli. Furthermore, they are interested in examining the long-term reproducibility of such responses.

The conventional method of monitoring swelling/deswelling kinetics of hydrogels is the weighing technique. In brief, the weighing procedure is as follows: hydrogel samples are taken from solution, water is removed on the sample surface by lightly blotting with paper, the hydrogel is weighed using a balance, and finally the measured weights are recorded. This technique, however, is tedious and cumbersome because weighing should be repeated at many selected times. In addition, it is difficult to discern a delicate weight change of a hydrogel in response to its environment.

Compared to conventional methods of measuring hydrogel properties, M-Biotech's System has the following advantages (following page):



M-Biotech's Hydrogel Swelling Kinetics Monitoring System

System Advantages

Continuous Evaluation

Offers Quantitative and continuous tracking of hydrogel swelling / de-swelling in an aqueous medium as a function of time.

Consistency

Eliminates the tedious and sometimes incorrect weighing procedure currently used to determine the level of soaking or water absorption of hydrogel.

Versatility

Enables researchers to study hydrogel responses to single or multiple environmental variables. Typical variables include: pH, temperature, and the concentration of analytes. The temperature and analyte concentration patterns are fully programmable.

Sensitivity

Utilizes very sensitive pressure transducers so that a small change in the swelling level (up to a few percent) can be precisely measured and stored as data for analysis.

Flexibility

Adapts to meet the various needs of a hydrogel research group.

System Specifications

Probes

- Pressure transducer, sensor nest, cap & mesh
- Various pressure transducers can be adapted to the system

Hydrogel Sample Size

- M-Biotech's Hydrogel Swelling Kinetics Monitoring System is designed to work with disc-shaped hydrogel samples with diameters in the range of 3 mm – 15 mm, and thickness in the ranges of 0.1mm – 3 mm.

Solution Container

- The solution container is customized for researchers' needs

Data Acquisition Unit

- Model: HP 34970A with HP 34901A 20 channel Multiplexer and HP 34907Amultifuntion Module
- Analog output: 2DAC, up to +/- 12 V
- Analog input: 20 voltage inputs
- Data transfer: RS232C

Automatic Solution Feeding System

- Digital I/O: 8 Form C digital output controlled by PC via USB
- Relays & Sockets: SPDT, 12 V activation, 12VAC/5A contact rate
- Pump: 20 ml/s, 120 VAC
- Solenoid valve: 120 VAC
- Power supply: +/- 12 VDC output, 120 VAC input
- Silicon tubing

Analysis & Control Software

- M-Biotech's Hydrogel Swelling Kinetics Monitoring System comes with easy-to-use Windows-based software for controlling the experiment and collecting and storing the swelling data.
- Analysis software: AP Benchlink, capable of remote setting for HP 34970A and data acquisition by RS232C.
- Control software: (1) sequence control of pumps for feeding and draining solution based on preset timer, (2) manual & automatic mode, (3) run time setup for pumps and measurements based on real time.
- PC requirements: Pentium III, 20 MB HDD, 64 MB RAM, RS232C, USB, and Windows 98SE, 2000, XP.

Ordering

To purchase or for questions about the Hydrogel Swelling Kinetics Monitoring System, please email us at m-biotech@m-biotech.com, or call us at 801.352.1733 for further information.