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Preface

A hydrogel is a network of hydrophilic polymers that are crosslinked by either covalent or physical bonds. It distinguishes itself from other polymer networks in that it swells dramatically in the presence of abundant water. The physicochemical and mechanical properties can be easily controlled, and hydrogels can be made to respond to changes in external factors. Such properties have made it useful for various applications ranging from biomedical and pharmaceutical to industrial applications. We can go back a century to find a reference on hydrogels made of natural polymers, but it is not until 1970s when the interest in hydrogels began to mature. Realization on the usefulness of hydrogels led to exponential increase in the references on hydrogels in 1990s, as shown in Fig. 1. Even in this age of computerized search, finding all the right references for certain applications is still difficult. There are simply too many references and digesting all those may take too

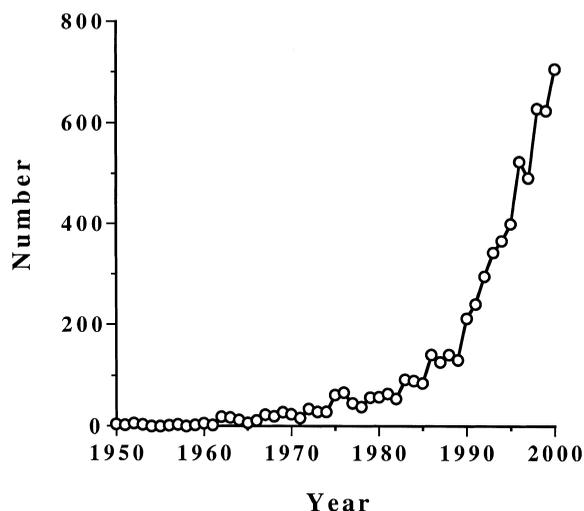


Fig. 1. Number of publications on hydrogels published in each year from 1950.

much time. This special issue on “Recent developments in hydrogels” is prepared in the hope to summarize the progresses made so far with relevant references, so that it can serve as a handy source of information on hydrogels.

The first chapter is an introduction to hydrogels, and it is followed by novel crosslinking methods for preparing biodegradable hydrogels. The next 3 chapters deals with environmentally-responsive hydrogels, so-called smart hydrogels, and their applications. Recent applications of hydrogels in delivery of proteins and oligonucleotides are also described in two separate chapters. The last chapter describes the possibility of using hydrogels for imprinting applications.

All the participants in this special issue had the same goal in providing the most updated information to the readers in a timely manner. They all put this project at the top of their agendas, and no words can adequately describe their enthusiasms and determinations in making the best review articles on hydrogels. Professor You Han Bae, who contributed a chapter in this special issue, once said that the current smart hydrogels have an IQ of 2. It can swell in water and also it can respond to environmental changes, such as change in pH or temperature. It is my wish that this special issue can serve as a starting point to create smart hydrogels with an IQ of 100, which is higher than mine.

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