

대기오염제어공학특론

1. 강의시간

월요일 (13:30 ~ 14:45)

화요일 (10:30 ~ 11:45)

2. 강의방법

- 비대면 온라인 실시간 동영상 강의
- 실시간 강의 URL: <https://zoom.us/j/8755406405>
- Ppt와 교재로 실시간 동영상 강의

3. 강의자료

- 1) Ppt: 학과 홈페이지 수업자료실에 업로드
- 2) 교재

4. 수강학생 사전 준비사항

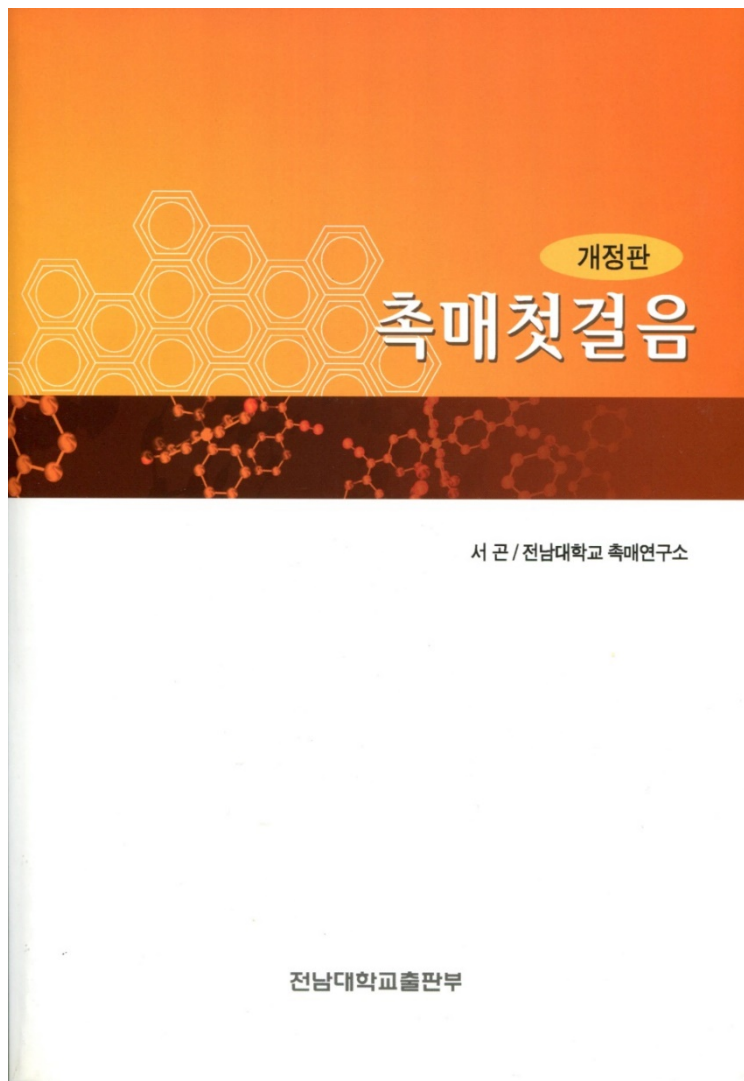
- PC 또는 스마트폰에 Zoom 설치/실행
- 온라인 음성/영상 송수신 방법 습득 등

5. 온라인 강의실 사전안내 방법

- 온라인 강의 전, URL 사이트와 온라인 강의 접속 ID는 타이거스에서 SMS와 DU Talk 앱으로 사전에 안내할 예정

※ DUTalk 앱 설치하시기 바랍니다.

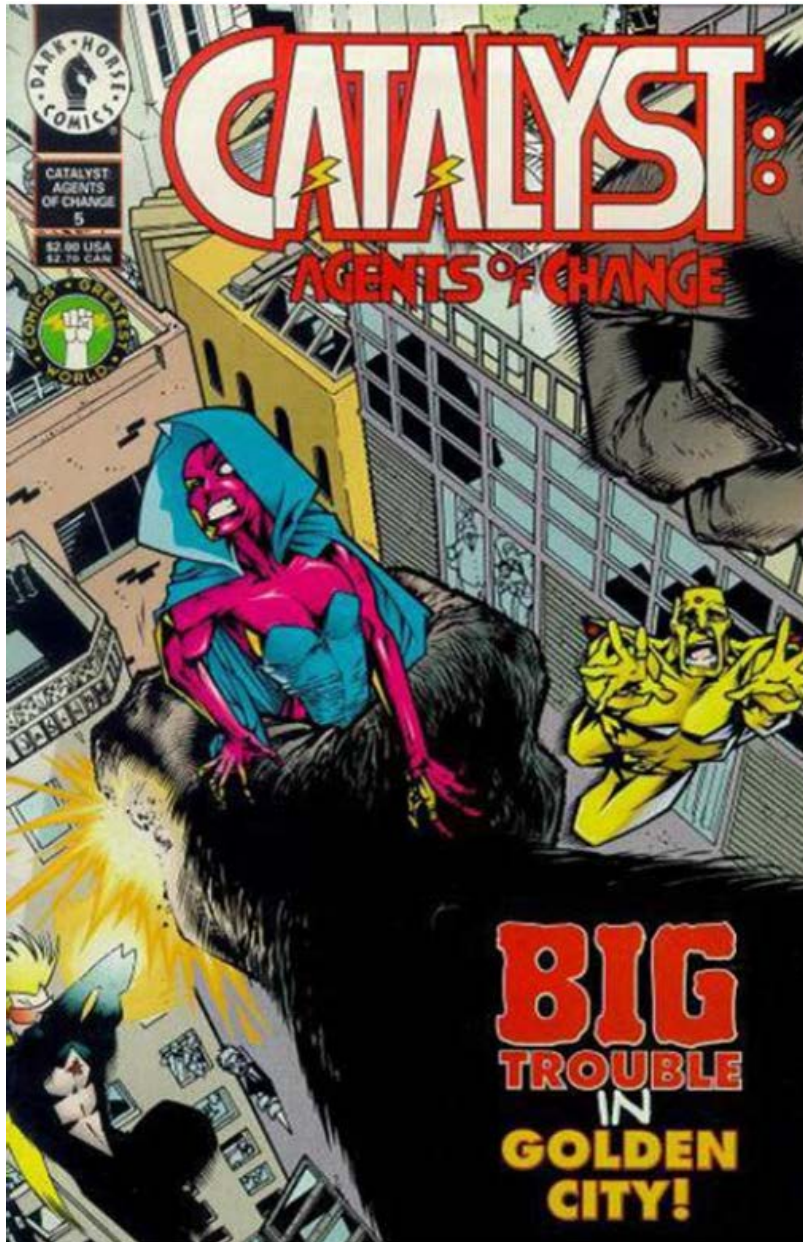
Textbook and References



Besides the orange-white book, this course will be with ones by:

1. Richardson,
2. Gabor,
3. Somorjai,
4. etc;

5. many theoretical papers.



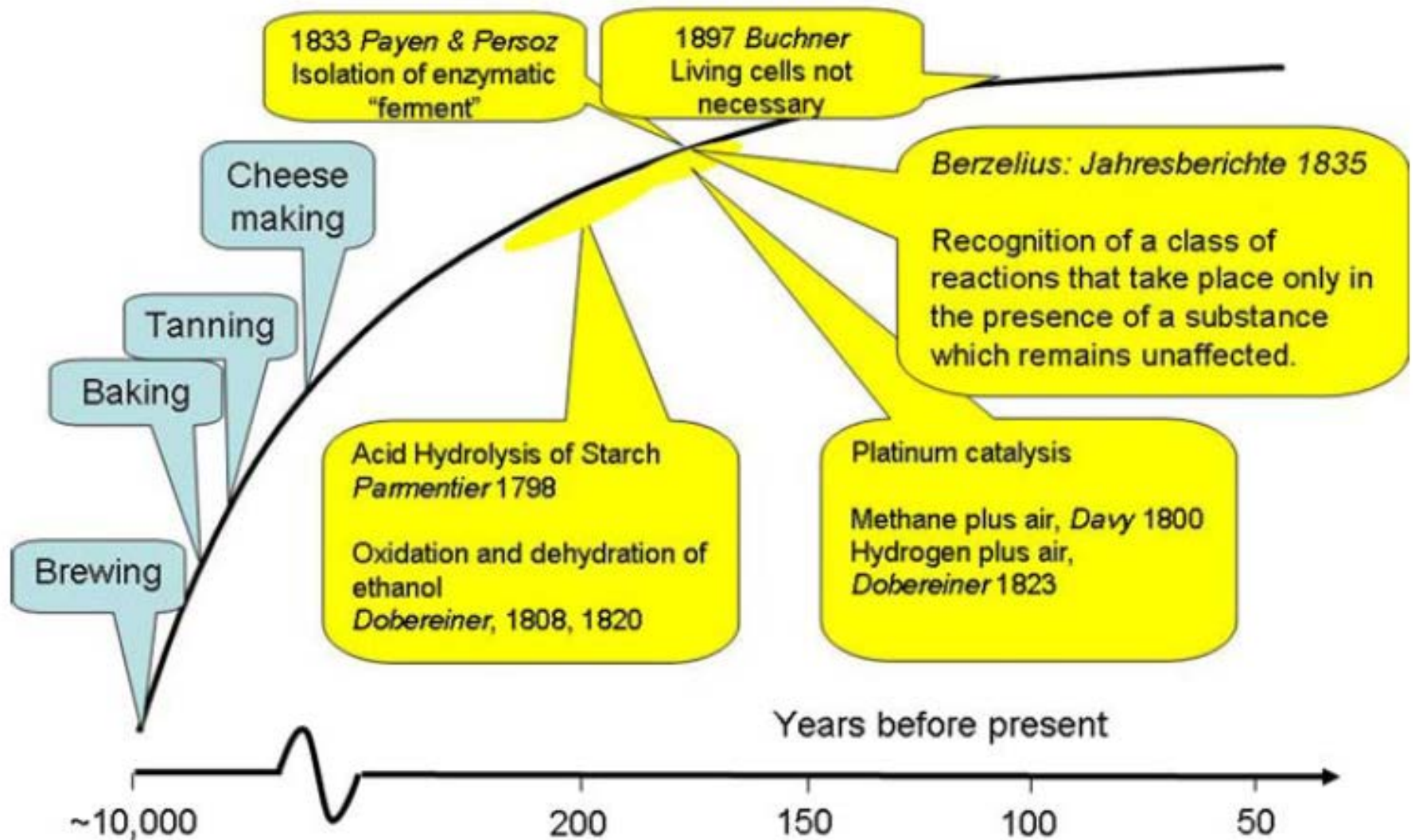
Catalytic technologies are ubiquitous, but their value is largely unrecognised by the public. By contrast, the concept of a “catalyst” as an “agent of change”, has escaped from the confines of the scientific literature to inhabit the world of advertising cliché. In 1835, Berzelius recognised that “catalytic power actually means that substances are able, *by their mere presence*, to waken affinities which are asleep at this temperature”. Before 1900, papers in Nature used the term “catalyst”. By 1950 (according to the Oxford English Dictionary), the word was being used in literary circles to describe a cause of sudden change of view or mood. Google “catalyst” and you will find the name applied to a host of products and organisations that have adopted the name to persuade potential customers of their ability to induce positive changes. Lots of management consultancies and training companies, replete with logos; bars, especially in college towns; a perfume; a rather good blended red wine from California; and a company selling sailing holidays in the Caribbean. No-one, at least to the author’s knowledge, has yet suggested that a catalyst can cause a sea-change.

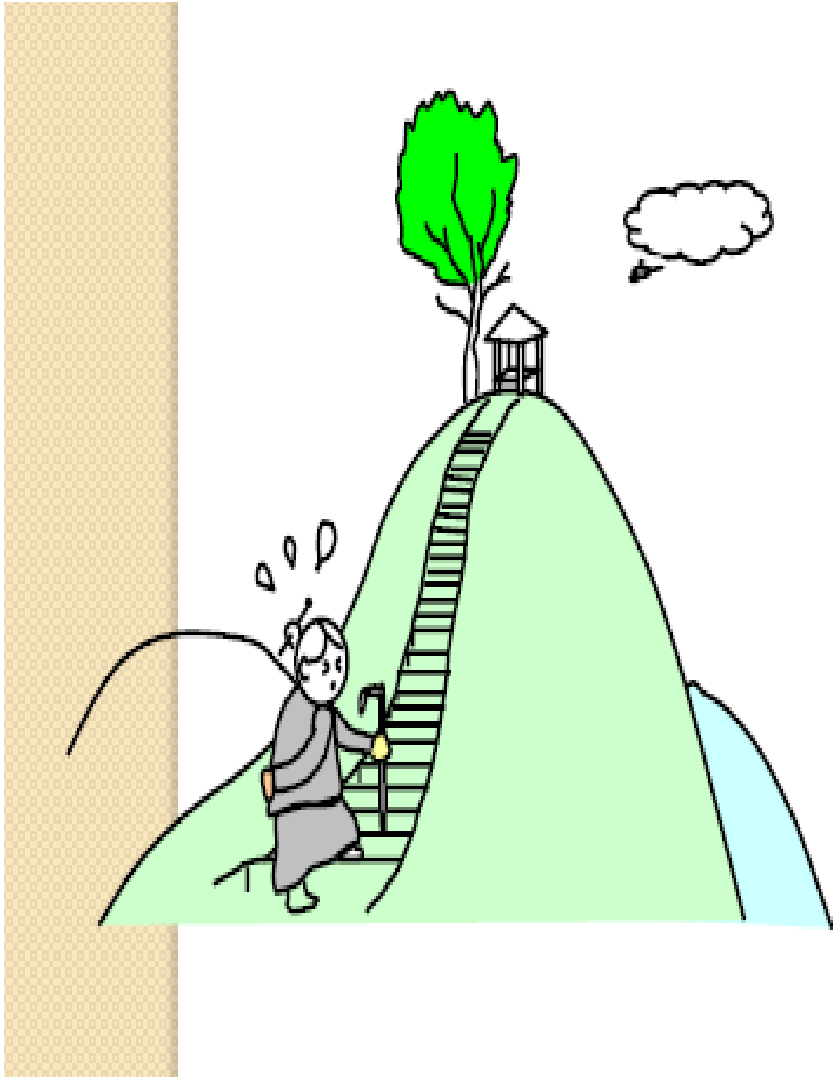
Jöns Jakob Berzelius (1779–1848)



- ❖ studied medicine and chemistry in Uppsala, Sweden
- ❖ worked as medical doctor, became Professor of Medicine and Pharmacy, 1810 Professor of Chemistry and Pharmacy
- ❖ stopped teaching in 1829 to devote himself to research

Catalysis: an early timeline

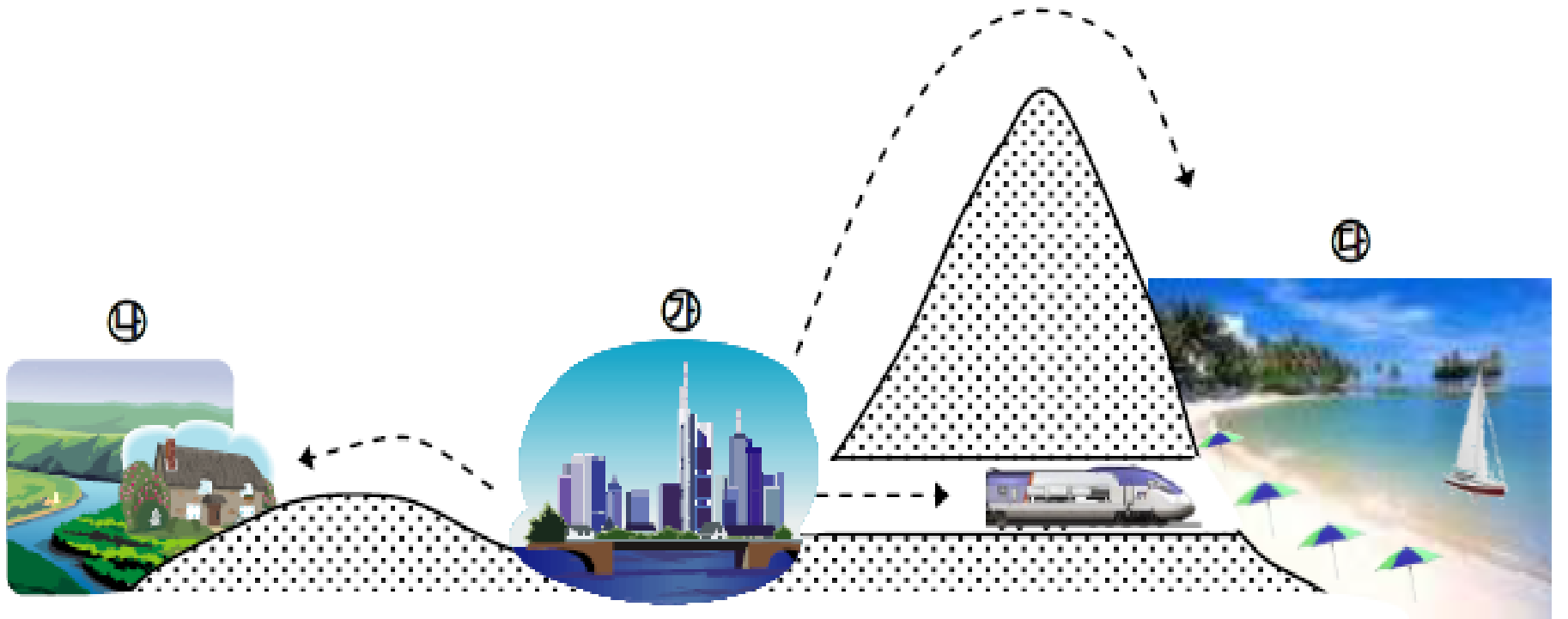




WHAT? OR/AND WHO?

AND/OR

HOW?



WHAT?

WHO?

HOW?

* 촉매 - 물질(catalyst), 촉매작용 - 기능(catalysis)

* 촉매 현상의 종합

1) 특정 반응 경로의 활성화에너지 감소 - 활성과 선택성 증진

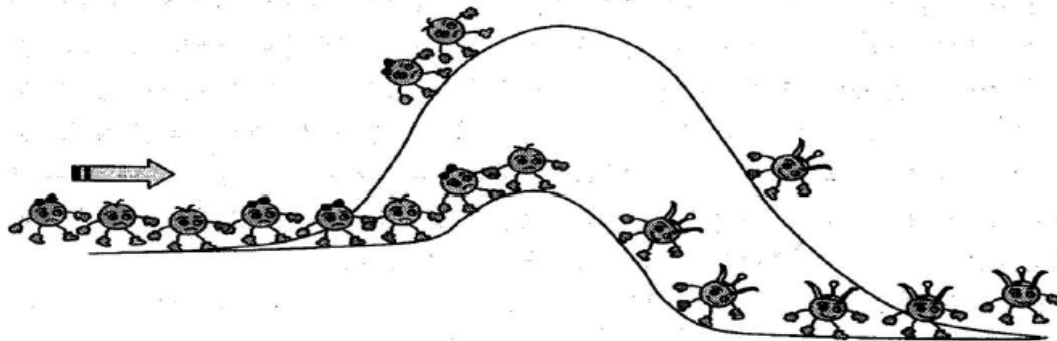
2) 촉매 활성점의 재생 - 소모되지 않는다. (소량으로도 기능을 나타낼 수 있음.)

⇒ a substance that in a small amount caused a large change. ^a

* IUPAC 정의:

- 소모되지 않으면서 화학 반응의 속도를 증진시키는 물질

(A catalyst is a substance that increases the rate of reaction toward equilibrium without being appreciably consumed in the process.) ^a



^a. [C. N. Satterfield, 'Heterogeneous Catalysis in Industrial Proctice', 2nd Ed. McGraw-Hill.]

* 촉매의 정의

- 활성화에너지가 작은 특정 반응 경로를 만들어 특정 물질을 생성하거나 분해·제거하는 화학 반응의 속도를 증진시키는 물질

- 1) 소모되지 않는다 - 소량, 재생
- 2) 반응 속도 - 증진

* Ostwald의 정의 (1901): 자신은 변하지 않으면서 화학반응의 속도를 변화시키는 물질

- 1) 화학반응 도중 촉매는 계속 변한다
- 2) 속도를 줄이는 물질 - 부촉매(negative catalyst)라고 부르기도 했음.
 - 억제제(inhibitor)가 더 적절하여 새로운 정의에서는 배제됨.

* 반응속도를 증진시키나 촉매는 아닌 물질:

- 1) 중합 반응에서 개시제
- 2) 에너지 빔 (빛, 전자 등 ...)

