

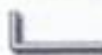
2. 바이오센서의 선두주자

■ 가정 혈당측정기

- 휴대형 : 소형화 가능
- 성능 : 정확성 보장
- 안전성 : 일회용 소모품
- 간편성 : 소량의 혈액샘플
- 가격 : 대량생산

Bayer Diagnostics

Bayer 

 Product Information

Glucometer ELITE®



1. Insert test strip



2. Touch tip to drop of blood

http://www.bayerdiag.com/product_info/self_test/elite/index.html

2. 바이오센서의 선두주자

■ 혈당센서 작동 원리

☞ 반사광 방식(Reflectance-based Methods)

$$\%R = \frac{I_u}{I_s} R_s$$

$$C \propto \frac{K}{S} = \frac{(1-R)^2}{2R}$$

I_u : reflected light from the sample

I_s : reflected light from a standard

R_s : the percent reflectivity of the standard

C : concentration

K : absorption coefficient

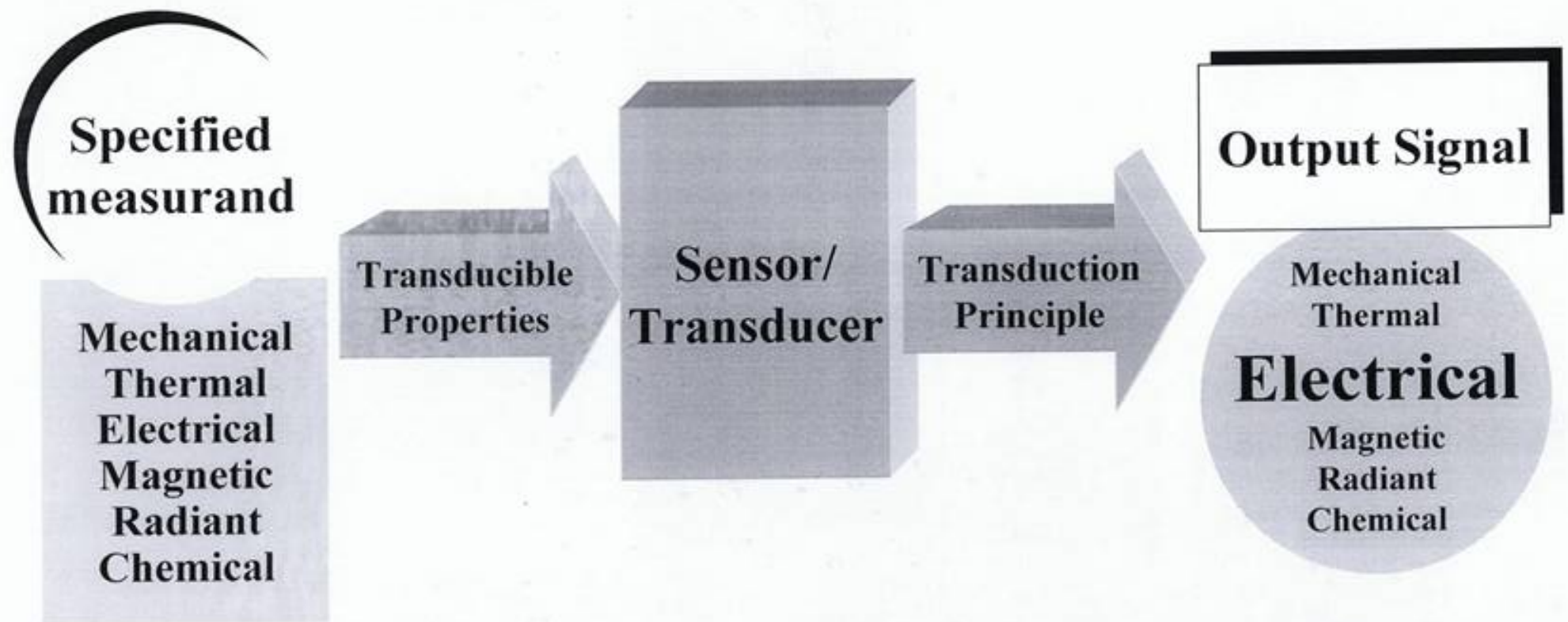
S : scattering coefficient

R : percent reflectance/100

☞ 전기화학적 방식(Electrochemical Methods) : 전류측정법(amperometry)

3. 바이오센서의 구조와 특성

■ 일반센서의 구조 및 원리



Ex : CO₂ in respiratory air

IR absorption

IR LED + photodiode

Voltage Output

2. 바이오센서의 선두주자

■ 상품화 혈당센서 작동 원리

Vendor	Test Strip	Method
Bayor Glucometer	Encore	Hexokinase
LifeScan/J&J	One Touch SureStep	Glucose Oxidase-Peroxidase Optical
Boehringer Mannheim	Accu-Chek Instant	Glucose Oxidase-Organic Mediator Optical
Boehringer Mannheim	Accu-Chek Easy	Glucose Oxidase-Prussian Blue
Bayor Glucometer	Elite	Glucose Oxidase-Ferricianide Electrochem.
Boehringer Mannheim	Accu-Chek Advantage	Glucose Oxidase-Ferricianide Electrochem.
MediSense	ExacTech, Companion2, Precision QID	Glucose Oxidase-Ferrocene Electrochem.

2. 바이오센서의 선두주자

<http://www.cranfield.ac.uk/biotech>

■ Biosensor World Market

Source: Cranfield Biotechnology Centre, UK (Spring, 1996)

Major Biosensor Companies

Company	US\$m	Comments
1. MediSense/(Abbott)	170	Medical: glucose
2. Boehringer Mannheim	165	Medical: glucose
3. Kyoto Daiichi/ Bayer/ Menarini	90	Medical: glucose
4. BIAcore/(Pharmacia)	19	Affinity sensors for pharmaceuticals and general bioscience research
5. YSI	14	Approx . US\$12m medical: glucose and lactate, US\$2m non-medical
6. Eppendorf	6	Medical: glucose and lactate
7. i-STAT	6	Approx . US\$3m medical: glucose, US\$3m medical other
8. Omron-Tyobo	6	Medical: glucose, urea and creatinine
9. Nova Biomedical	3	Medical: glucose, urea, lactate and creatinine (part of larger menu)
10. Molecular Devices	3	Pharmaceutical and defence
11. Others	26	US\$7m medical: glucose, US\$2m medical: other, US\$7m non-medical: US\$10 environmental
Total	508	

2. 바이오센서의 선두주자

<http://www.cranfield.ac.uk/biotech>

■ Biosensor World Market

Source: Cranfield Biotechnology Centre, UK (Spring, 1996)

Biosensor Market by Sectors

Sectors	US\$m	%	Comments
1 Medical: glucose	456	90%	MediSense / (Abbott), Boehringer, Bayer, YSI, etc.
2 Medical: other	11	2%	Lactate, urea, etc.
3 Environmental	10	2%	Mainly BOD indicators
4 Other	31	6%	Fermentation monitoring, food, alcohol, BIAcore, IAsys, etc.
Total	508	100%	

3. 바이오센서의 구조와 특성

■ 화학센서의 필요성과 문제점

