

강의계획서(2020년 1학기)

교과목명	열역학	분반	1	담당교수명	김철주
과목코드	0000103697				
학과·학년	화 2	학점	3.0	연구실번호	
요일, 시간	화 1-A, 화 1-B, 화 2-A, 화 2-B, 목 3-A, 목 3-B	교과목구분	전공필수	강의실	전주: 자연과학대학1호관 110

수업목표	<p>Chemistry is the science of matter and the changes it can undergo. Physical Chemistry is the branch of chemistry that establishes and develops the principles of the subject in terms of the underlying concepts of physics and the language of mathematics.</p> <p>In this lecture, it will introduce some of the basic concepts of thermodynamics, which assess the energy change that physical and chemical change.</p> <p>We see that we can obtain a unified view of equilibrium and the the direction of spontaneous change in terms of the chemical potentials of substances.</p> <p>[Lecture Materials] : Department of Chemistry mistry, Home Page(http://chemipia.chonbuk.ac.kr/) Cheol-Ju Kim-Lecture-Thermodynamics(Engel)</p>
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직전 강의평가 반영사항	I will write legible writing Character on the board in order to understand without any serious drawback. I will move students in front seat they have to see my writing character.
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6대 핵심역량과의 관계

구분	소통역량	창의역량	인성역량	실무역량	모형역량	문화역량	합계
강의반영 비율(%)	20	30	10	10	10	20	100

주별 내용						수업방식별시간	
						온라인	오프라인
제 1주	Introduction [Chap 1] The Properties of Gases: Ideal Gas - Thermodynamic State Functions: Perfect Gas Law; Temperatrue(T), Press(P), Volume(V), Number of moles(n) - Perfect Gas Law; $PV = nRT$						
제 2주	[Chap 1] The Properties of Gases: Real Gas - State variables(P, V, T, n); Ideal gas Law; Partial Pressure; [Chapter 1 HomeWork (Exsercise)] 1-6; 1-7; 1-12; 1-161-18; 1-36						
제 3주	[Chap 2] The First Law of Thermodynamics: Law of Energy Conservation -Energy: Work and Heat ; Work, Heat, and Enthalpy; Heat Capacities(Cv, Cp), Temperature dependence of Enthalpy [Chapter 2 HomeWork (Exsercise)] 2-3; 2-6; 2-12; 2-14; 2-16; 2-44						
제 4주	[Chap 3] The First Law of Thermodynamics-Enthalpy : - Mathmetical Expression df Energies; Joule-Thonson Experiment; Calorimeter; Reaction Enthalpy; [Chapter 3 HomeWork (Exsercise)] 3-12; 3-31; 3-32; 3-36 2-34; 2-35; 2-50; 2-54						
제 5주	[Chap 4] ThermoChemistry: - Calorimeter; Reaction Enthalpy; Hess's Law; [Chapter 4 HomeWork (Exsercise)] 4-2; 4-3; 4-8; 4-9; 4-19; 4-28						
제 6주	[Chap 4] ThermoChemistry: Standard Enthalpy of Formation; Temperature dependence of Enthalpy <1st Exam>						

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제 7주	[Chap 5] The 2nd Law of Thermodynamics-Entropy; -Entropy; Clausius Inequality; Reaction Entropy;		
제 8주	[Chap 5] The 2nd Law of Thermodynamics-Gibbs Free Energy and Equilibrium ; -Entropy and Temperature Change; Carnot's Cycle; Free Energy [Chapter 5 HomeWork (Exsercise)] 5-5; 5-9; 5-13; 5-17; 5-23		
제9주	[Chap 6] Chemical Equilibrium: -Equilibrium Constant; Standard Gibbs Free Energy; Equilibrium and Temperature [Chapter 6 HomeWork (Exsercise)] 6-1; 6-3; 6-10; 6-13; 6-24; 6-34		
제 10주	[Chap 7] Real Gases: - Interaction between Molecules; Van der Waals Gae Equation; Critical Point and Critical constants; Compression Factor(Z) [Chapter 7 HomeWork (Exsercise)] 7-7; 7-8; 7-11; 7-17		
제 11주	Solving Excercise [2nd Eama]		
제 12주	[Chap 8] Phase Equilibria: - P-T phase diagram; Phase Equilibrium and Clausius-Clapeyron 식; Phase Diagram: Phase rule and Two-Component System [Chapter 8 HomeWork (Exsercise)] 8-5; 8-8; 8-9; 8-22; 8-37		
제 13주	[Chap 9] Solutions: -Ideal Solution and Raoult's Law; Henry's Law; Colligative Properties; Real Solution; [Chapter 9 HomeWork (Exsercise)] 9-2; 9-4; 9-7; 9-12; 9-15; 9-24		
제 14주	[Chap 10] Thermodynamics of Biochemical Reaction - Activities of Ions; Debye-Huckel Limiting Law; Equilibrium Constant in Electrolyte; [Chapter 10 HomeWork (Exsercise)] 10-3; 10-13; 10-14; 10-28		
제 15주	[Chap 11] Electrochemistry & Equilibrium: -Oxidation-Reduction; Galvanic Cell; Half-cell Poterntial; Nernst Equation [Chapter 11 HomeWork (Exsercise)] 11-1; 11-7; 11-8; 11-17; 11-28 Solving Excercise [3rd Exam]		
제 16주			

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권장 선수과목	general chemistry 1,2; Mathematics for Science																									
주교재	Physical Chemistry (3th Ed.) Author: Engel & Reid Press: Benjamin Cummings																									
저자	T. Engel & P. Reid			출판사	Benjamin Cummings			출판년도	2012																	
참고자료	Reference Book 1: Physical Chemistry (8th Ed.) Author: P.W. Atkins Press: Oxford 2014 Reference Book 2: Physical Chemistry Author: McQuarrie & Simon Press: Univ. Science Books Reference Book 3: Physical Chemistry (4th Ed.) Author: Silbey, Alberty, Bawendi Press: Wiley																									
교재언어	영어			강의언어	영어																					
필요기자재																										
상대/절대평가 구분	상대평가 I (A40%)			상대평가 II 비율 (A:A+B:C이하)		0	:	0	:	0	총 비율 (%)	0														
절대평가 기준																										
평가계획	평가 요소별 배점 <table border="1"> <tr> <td>중간</td> <td>40%</td> <td>기말</td> <td>40%</td> <td>출석</td> <td>10%</td> <td>과제물</td> <td>10%</td> <td>안전교육</td> <td>0%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> 기타(!st Exam. + 2nd Exam + 3rd Exam = 80 ; attendance = 10 ; HomeWork = 10)										중간	40%	기말	40%	출석	10%	과제물	10%	안전교육	0%						
중간	40%	기말	40%	출석	10%	과제물	10%	안전교육	0%																	
참고 사항	* 장애학생 교수학습지원 사항																									
	- 강의 <input checked="" type="checkbox"/> 강의 파일, 자료 등 제공 <input type="checkbox"/> 좌석배치(지정좌석) 조정 <input type="checkbox"/> 기타:																									
	- 과제 <input checked="" type="checkbox"/> 과제 제출기한 연장 <input type="checkbox"/> 대안적 과제 제시																									
	- 평가 <input checked="" type="checkbox"/> 시험시간 연장 <input type="checkbox"/> 평가방법 조정(대독, 구두응답, 도우미 대필 답안작성 등) <input type="checkbox"/> 별도의 시험 장소 제공 <input type="checkbox"/> 기타:																									
	<input type="checkbox"/> 그 외(필요시 자유로이 추가 기술)																									
※ 위 지원사항 등을 포함한 강의, 과제, 시험 등 학습과정에서 장애로 인하여 추가 지원이 필요한 경우 개강전 담당강사 및 장애학생지원센터를 통해 문의 바랍니다.																										