

淡江大學九十一學年度碩士班招生考試試題

44 P1

系別：化學系

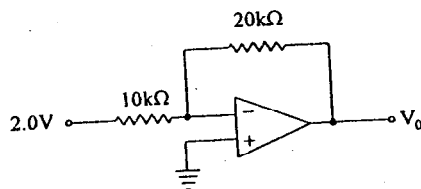
科目：分析化學

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計算機	字典
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本試題雙面印製

- In which solvent would the fluorescence of naphthalene be expected to be greatest? (a) 1-chloropropane (b) 1-bromopropane (c) 1-iodopropane? Why? (10%)
- The infrared spectrum of CO shows a vibrational absorption peak at 2170cm^{-1} . What is the force constant for the CO bond? (10%)
- Compare the difference for instrumental design of the double-beam UV instrument with that of the double-beam IR spectrometer. (10%)
- Which of the following molecules listed below absorb IR radiation? (a) H_2 (b) HCl (c) D_2 (d) HF (e) F_2 (10%)
- What is (are) the light source(s) of AAS (Atomic Absorption Spectrometer) (10%)
- Calculate the dissociation constant of the weak acid (HP) for the following cell:
Pt, $\text{H}_2(1.00\text{atm})|\text{HP}(0.010\text{M}), \text{NaP}(0.030\text{M}), \text{NaCl}(5.53 \times 10^{-3}\text{M}), \text{AgCl}(\text{sat'd})|\text{Ag}$ ($E_{\text{cell}} = 0.605\text{V}$) (10%)
- Define: ion trap tandem mass spectrometer. (10%)
- Calculate the energy in cm^{-1} of a photon with a wavelength of $4.00\ \mu\text{m}$. (10%)
- Compare MALD (matrix assisted laser desorption) with ESI (electrospray ionization)? (10%)
- For the following circuit, calculate the output voltage? (10%)



◀ 注意背面尚有試題 ▶

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Important Physical Constants

Constant	Symbol	Value
Speed of light (<i>vacuo</i>)	<i>c</i>	$2.99792 \times 10^8 \text{ ms}^{-1}$
Planck constant	<i>h</i>	$6.62608 \times 10^{-34} \text{ J s}$
Avogadro number	<i>N</i>	$6.022137 \times 10^{23} \text{ particles mol}^{-1}$
Faraday constant	<i>F</i>	$96485.31 \text{ C mol}^{-1}$
Gas constant	<i>R</i>	$8.31451 \times \text{J K}^{-1} \text{ mol}^{-1}$ $0.0820578 \text{ L atm K}^{-1} \text{ mol}^{-1}$
Boltzmann constant	<i>k</i>	$1.38066 \times 10^{-23} \text{ J K}^{-1}$
Rest mass of the electron	<i>m_e</i>	$9.10939 \times 10^{-31} \text{ kg}$
Electronic charge	<i>e</i>	$-1.602177 \times 10^{-19} \text{ C}$

Energy Conversion Factors

	Joules	Ergs	Calories	Liter Atmosphere	Electron Volts
1 joule =	1	10^7	2.3901×10^{-1}	9.8687×10^{-3}	6.2418×10^{18}
1 erg =	10^{-7}	1	2.3901×10^{-8}	9.8687×10^{-10}	6.2418×10^{11}
1 calorie =	4.1840	4.1840×10^7	1	4.1291×10^{-2}	2.6116×10^{19}
1 liter atmosphere =	1.0133×10^2	1.0133×10^9	24.218	1	6.3248×10^{20}
1 electron volt =	1.6021×10^{-19}	1.6021×10^{-12}	3.8291×10^{-20}	1.5811×10^{-21}	1

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International Atomic Masses

Element	Symbol	Atomic Number	Atomic Weight	Element	Symbol	Atomic Number	Atomic Weight
Actinium	Ac	89	(227)	Mercury	Hg	80	200.59
Aluminum	Al	13	26.98154	Molybdenum	Mo	42	95.94
Americium	Am	95	(243)	Neodymium	Nd	60	144.24
Antimony	Sb	51	121.75	Neon	Ne	10	20.1797
Argon	Ar	18	39.948	Neptunium	Np	93	(237)
Arsenic	As	33	74.92159	Nickel	Ni	28	58.69
Astatine	At	85	(210)	Niobium	Nb	41	92.9064
Barium	Ba	56	137.327	Nitrogen	N	7	14.00674
Berkelium	Bk	97	(247)	Nobelium	No	102	(259)
Beryllium	Be	4	9.0122	Osmium	Os	76	190.2
Bismuth	Bi	83	208.9804	Oxygen	O	8	15.9994
Boron	B	5	10.811	Palladium	Pd	46	106.42
Bromine	Br	35	79.904	Phosphorus	P	15	30.9738
Cadmium	Cd	48	112.411	Platinum	Pt	78	195.08
Calcium	Ca	20	40.078	Plutonium	Pu	94	(244)
Californium	Cf	98	(251)	Polonium	Po	84	(209)
Carbon	C	6	12.01115	Potassium	K	19	39.0983
Cerium	Ce	58	140.115	Praseodymium	Pr	59	140.9076
Cesium	Cs	55	132.9054	Promethium	Pm	61	(145)
Chlorine	Cl	17	35.4527	Protactinium	Pa	91	(231.03588)
Chromium	Cr	24	51.9961	Radium	Ra	88	(226)
Cobalt	Co	27	58.9332	Radon	Rn	86	(222)
Copper	Cu	29	63.546	Rhenium	Re	75	186.207
Curium	Cm	96	(247)	Rhodium	Rh	45	102.9055
Dysprosium	Dy	66	162.50	Rubidium	Rb	37	85.4678
Einsteinium	Es	99	(252)	Ruthenium	Ru	44	101.07
Erbium	Er	68	167.26	Samarium	Sm	62	150.36
Europium	Eu	63	151.965	Scandium	Sc	21	44.9559
Fermium	Fm	100	(257)	Selenium	Se	34	78.96
Fluorine	F	9	18.9984	Silicon	Si	14	28.0855
Francium	Fr	87	(223)	Silver	Ag	47	107.8682
Gadolinium	Gd	64	157.25	Sodium	Na	11	22.9898
Gallium	Ga	31	69.723	Strontium	Sr	38	87.62
Germanium	Ge	32	72.61	Sulfur	S	16	32.066
Gold	Au	79	196.9665	Tantalum	Ta	73	180.9479
Hafnium	Hf	72	178.49	Technetium	Tc	43	(98)
Helium	He	2	4.0026	Tellurium	Te	52	127.60
Holmium	Ho	67	164.930	Terbium	Tb	65	158.9253
Hydrogen	H	1	1.00794	Thallium	Tl	81	204.3833
Indium	In	49	114.82	Thorium	Th	90	232.0381
Iodine	I	53	126.90447	Thulium	Tm	69	168.9342
Iridium	Ir	77	192.22	Tin	Sn	50	118.710
Iron	Fe	26	55.847	Titanium	Ti	22	47.88
Krypton	Kr	36	83.80	Tungsten	W	74	183.85
Lanthanum	La	57	138.9055	Uranium	U	92	238.0289
Lawrencium	Lw	103	(260)	Vanadium	V	23	50.9415
Lead	Pb	82	207.19	Xenon	Xe	54	131.29
Lithium	Li	3	6.941	Ytterbium	Yb	70	173.04
Lutetium	Lu	71	174.967				