- 18	P. P.E.7 11		the second the second s
		Ist Excited State Energy level & Hydrogen	Assignment 5.14, 5.16 & 5.22
1.75	P: 6.20	has alon P	2. 5.2, 5.3, 5.14,
11/2		U = 10.2 eV	
3:30	+st frait		2) Production of Amononia 2NH3
	CACHEO	State is really 4 widependent states,	200x D-160 - 1810 Pa
S. C. C.	E = -13.6ev 30	F = 3.4+136 all with some energy at I.	AH and S tabulated at the end of books,
BILL ST	Eze-1.5er	E 10-200 Com	
100 .33		(il) with	value fact
1000	Temp?	you which Neamholly Free Energy For	G = BH-TBS TO THE STATE OF THE
4		Hydrogen atow in Ist Excited level	$\Delta H = 2 + \Delta H \left( NH_3 \right) - \Delta H \left( H_3 \right)$ $-3 \Delta H \left( H_3 \right) = 3 \Delta H \left( H_3 \right)$
100	107 8	ti de atris	- AH = 2(-46.11 K) -0 - 3(0)
CH.		is positive, and is negative.	ΔH = -92.22 KJ
Jan P	Pulat 1	E = 0 for ground state	and Games - soul
PR. A.	27	F is negative of any state, alone will spentaneously go to that state some minimum.	AS = 2\$A\$(N#3) - AS(N2) - 3 + AS(H2)
	50 4	spontaneously go to that state son minimum.	= 2(192.45 T/K) - 191.61 J - 3 * 130.68 T/K
3.6	(T,V,N constant)	For small system housever, the	K CAVET AVAIL
NOT BE	(214)10	answer is probablished to	⇒ (DS = -198.753/K)
	Solution	Kandom ginium	Now AG = AH - TAS = -92:22 KJ - (300K) (-198
11/11	2000	20,49 1 490 4410	Now 69 = BH = 120
100		F-11-TS	5 (AG = -32.99 KJ) to 2 moles of K)
539	1 08	1-11-1 SH U =10.2 EV	rmonia
No	ger I	S=kln52=blu4	DG & Imol & Amonia = 1/2(-32.99 KJ)
1 1		J -12-11- 12	= -16.4495 KS
11		F = 10.2 eV - T. hen 4	Tabulated Value for DG of 1 mol
44		- il he in	labulated Value for 240
THE REAL PROPERTY.	+ I Tislo	ow, Fis the => Atom will be in ground state, whore F=0.	8 NH2 (9) is -16.45 KJ
172	-	ground state, where	P. (5.5) Fuel Cell using Meliane (Maline) Jos)  CHy + 20 2 H20+ CO2 Room Fup
500	- AL liel	T, p is - ye, therefore above will	DIG.5 Fred Coll usin Melhane (Natural gas)
10.0	7 HI sign	most probably be in	CH4 + 20 > 2 H20 + CO2 Room Feep  CH4 + 20 > 2 H20 + CO2  Post Feet  Post Feet
THE R		excitod state	(a) SH & AG? use tabulation & Alim Pros.  (b) SH & AG? use tabulation & Alim Pros.  Aligned gan gan gan  AH = 2AH(H <sub>2</sub> O) + AH(CO <sub>2</sub> ) - AH(CH <sub>0</sub> ) - 2AH(Q)
10	Tone	exition temp can be obtained by	(a) DH & DG ! use Tabulation your gas.
	1700	sent of the leave of	All - 9 AU (40) - AH (CH) - 2 AH(Q)
		$F = 0 = V - TS$ $\Rightarrow T = \frac{10.22 \text{ R}}{10.22 \text{ R}}$	DA 5 / DH(13-) + OH(02)
7 1		> T - U/ = 10 mg	- 2(-285.83 KJ)+(-393.51KJ)-(-74.81KJ)-2(0)
1.10		2) 1 = 75 2611	⇒ (AH = -890.36 KJ)
HALL		where S= bln4.	and
		1 Tz = 8.62 x /5 el	DG = 206 (H20)+06(CQ)-06(CH4)-206(D)
111		To the second se	( 200 200) ( 206 36 WE) (-50 72 KE)-2(0)
319		T= 10.2 eV (8.62×10 eV. ln4)	-2 (-201.1310) + (-311.10)-(-311.10)
10		(8-62×10 eV. (m/4)	= (BG = -817.90 KJ)
111		( B B = N = END)	( 29 - 017 )
111		=> \( \int = 8.5 \tau 15" K	
218		11	Catinued next page.
101	11 -	- C 1. + 4 . Hudrosen atom will be u	in ground state P(55) Continued next parge.  b,c, & d.  It created
113	y TL	8.3 \$10 K 3 Aquinous	-t. r// 0,c,x a.
	0.74	T>8.5 x /0 1/K ,	State )
1	24		
130		The same of the sa	
1 11/1	THE AND STATE		
11			

	-	1	
		The second in the second	Pr 5.14 Pelationship Was Cp 2.Cv
	Continue	Assume ideal performance	(a) From p: 3.33 - heat capacity expression
	(b)	Electric Works? Obtained from this cell.	1 -4 -1 -1 -1
			Express 45 in partial derivatives
	Id	ed cond. all decrease in DG in above	( as) and ( as)
	Aport	reaction comes out as Electric Works	AS S(T, V)
	( 100 mg - 10 ).	Electric work out = (817.90 KJ)~810	$ds = \left(\frac{\partial s}{\partial T}\right)dT + \left(\frac{\partial s}{\partial V}\right)dV - T$
	(201) (20) /-	The state of the s	2
	(c)	Waste heat produced?	45 in P: 3.33 (05) 07 = CV
		Heat waste = AH- AG = 890-36 - 817-90 K.	Tasi ot T
	sun of electric of	heat 72 KJ	Cy=T(\frac{\partial}{\partial})
	San of Culture		(b) consider V(T,P) = dV= tov) dt (8V) dp.
	(d)	léps ui reaction is	Plugging into eq I;
	at - electrode	CH4 + 2HO → CO2+8H+ 8€	ds = (DS) dT+(DS) (DV) HOP) dp
	at + electrode		STV SV, OTP SP7
	69.5	The state of the s	Set dP=0 to find Cp 1857 17. 185 \ 18V) 17
		Poltage of Cell?	[for constact P] dS - ( 25 ) dT + ( 25 ) ( 2V ) dT
1	For ea	ch melecule of methan 8 electrons are	0
	what was	pushed around the circuit	E ESTON
	× 1	· Voltage - Electric work done	$\frac{\partial}{\partial x} = \frac{\partial}{\partial x} + \frac{\partial}{\partial y} = \frac{\partial}{\partial y} + \frac{\partial}{\partial y} = \frac{\partial}{\partial y} + \frac{\partial}{\partial y} = \frac{\partial}$
1		Total charge	noth of POTV OV TOTP
1		= 818 KJ ##	1.Co = Cv , (83) (84)
1	utal charge so	8(1.6310 (6.021/02)	$\frac{1}{7}G = \frac{C_V}{7} + \left(\frac{93}{8V}\right) \cdot \left(\frac{3V}{8T}\right)_P$
	R + election + 6×10	33 moleculs	or/p c T (95) (8V)
N.	molecule	mal = Voltage 1.06 V	$\frac{\partial f}{\partial p} - C_{\nu} = T \left( \frac{\partial S}{\partial \nu} \right)_{\tau} \left( \frac{\partial S}{\partial \tau} \right)_{\rho}$
1	F	or 1 mole	we to the
	2	g melieu	Results g(P:1.46) Maxwell redation
-		WAR THE WEST	Kentiletty Halmitally the edersy.
		7-11	1. 15 DI - SEUN WI.
	3000		8TV = while with the
		The Carlotte of the Carlotte o	185) - P/ ( and de red
		au 6.00 10 - 7 11 - 230	(SV) - 1 (SELY)
1			139 18P) Tds=PdV
			$\left(\frac{\partial \mathbf{S}}{\partial V}\right) = \left(\frac{\partial \mathbf{S}}{\partial V}\right) = \frac{\partial \mathbf{S}}{\partial V} = \frac{\partial \mathbf{S}}{\partial V$
-			11/0
			$C_{\rho} - C_{\nu} = T(\frac{\partial \rho}{\partial T})(\frac{\partial \nu}{\partial T})_{\rho}$
			1
Teles		The state of the s	the same of the sa
7 1	A Water	THE RESERVED AND ADDRESS OF THE PERSON NAMED IN	THE RESIDENCE OF THE PERSON OF
		· 新加州中国 (1980年)	<b>达</b> 为1000年,1000年的1000年的第二日

IN Jave	
P.5. 14 Contined (25) 4 (26) 4 (25) 4	the last Man G.
P:5-14 Coolined	(e) Argue Cp can't be less than G.
	2, -0, - 1 2779 10 - 2
P:1.46 Party = (2P) = - (2/5T/P - 20/5T/P - 20/5T/P - 20/5T/P - 20/5T/P - 20/5T/P	Alkaugh & (called & in book) & Cambe
1 (8/26)4 miles	regletly negative but it appears as
Above Go-G = T(OP) (OV)	square in C-C = TV X2 aTV B
(ag per)	But K can never be nogotius
$ \left(\begin{array}{c} \left( \left(\begin{array}{c} \left( \left(\begin{array}{c} \left( \left(\begin{array}{c} \left( \left( \right) \right) \right) \right) \right) \right) \right) \\ \left( \left( \left(\begin{array}{c} \left( \left( \left(\begin{array}{c} \left( $	But K can never be negative
(or) (ov)	⇒ C - C Will always & is negative
(SP) <sub>T</sub> (SP) <sub>T</sub>	P C-C will always & I is regative for per the trumbers or felymens - remote a problem.
Co-efficient of expansion $X = \frac{1}{V} \begin{pmatrix} \frac{\partial V}{\partial V} \end{pmatrix}$ and $X = \frac{1}{V} \begin{pmatrix} \frac{\partial V}{\partial V} \end{pmatrix}$	Cp C (classys)
$X = \frac{1}{2} \left( \frac{\partial V}{\partial V} \right)$ and $\frac{\partial V}{\partial V} \left( \frac{\partial V}{\partial V} \right)$	or cp-cv = 0 only if d=0
19 1 STP 7 - 1 SP4	P
: Co-C = -T V. x2 TV x2	(f) For mercury Cp-Cv= ruse data)
Why Ky	1 19 8 Marchy 22 - (298 VIO 6 3) [2.57×10]
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(F) For mercury Cp-Cv=? (Usedala)  Cp-Cv= TV 2 = (298 × 10 m/s) [2.5710 1]  Kr 4.52+10 m/s  4.52+10 m/s  4.52+10 m/s
(Rellia Hard)	
	En moreury ~ 10 ms
(d) check for an ideal gas	For mercury ~106 ms  X (or Basnibach) = 2.57 × 10 4 1
Ideal gas (Nb)	8 K - 1 C - 10/
$\propto = -\left(\frac{NR}{P}\right)$ $\frac{\partial U}{\partial \Gamma} = \left(\frac{NR}{P}\right)$	& K = 4.52 + 10 10 1.
bleal gas	t we get
d = F For ideal gas	(Cp-Cy = 0.0435 J/K)
White INV	
while $K = -\frac{1}{\sqrt{8P}} \Rightarrow K_{1} = \frac{1}{p}$	Way data fu P:405 (=) Co-Co = 3.58 /
	Whis data for P:405 (=) Cp-Cy = 3.58 TK
New as porto; Cp-Cv=TV xx=TV /22 = TV.P	1/9) Temp dependence
1/P 1 72	(9) Temp dependence  Cp-C, is Tol' grim V & K.  OT TB2. at Solids are uneables
=VP=Nh	Cp-Cy is Tot sein V&K
T 1. 12 dats	Q +0 ds T+0 depudent at T.
=> (Cp-Cv = Nb) which agrees what	The workston as I I a
me had in 89, 51.48)	Therefore as T > 0  C - C - > 0 or C - C V
me had in Eg (1.48)	1 O T T P I I I I I I I I I I I I I I I I I
ANGELY OF YOUR YORK	At high Temp: $\chi(T)$ is relatively Constant
1 1994 1994	Therefor (Co-Cy) X T
The second secon	Note that
1 - 72 2 10 1	July Course & Co.
F self and	
	the state of the s
A AND DESCRIPTION OF THE PARTY	AND THE RESERVE THE PROPERTY OF THE PARTY OF

perfluid ( Cat out ( Cat)	a the headed
$P = \frac{1}{V} \left( \frac{\partial V}{\partial T} \right)_{p}$ $K = \frac{1}{V} \left( \frac{\partial V}{\partial P} \right)_{T}  \text{and}  K_{s} = -\frac{1}{V} \left( \frac{\partial V}{\partial P} \right)_{s}$	well to Especial formula for A of
$t_{+} = \frac{1}{V} \left( \frac{\partial P}{\partial P} \right)$ and $t_{+} = \frac{1}{V} \left( \frac{\partial P}{\partial P} \right)$	: K-Ks= B(DV) (OF)
150 literal empressibility Adiobatic Compressibil	Neva But (2K) = +VB
Drive B- Cooff of	Neva (2T)= ++P
150/kernal Compressibilly Adiabatic Compressibil  Drive  K=Ks + TVB2 P-Confession  Exponence	$K - K_s = \beta \cdot V \cdot \beta \cdot \left(\frac{\partial T}{\partial s}\right)$
and check against ideal gas.	=VB. To We know (25) #C1 OTP
and check against educed gas.  As $V(P,T) \Rightarrow dV = \frac{\partial V}{\partial P} dP + \frac{\partial V}{\partial T} dT$ -VK	Herr
-VK_T	$K_{T} = K_{S} + \frac{TVB}{C_{P}}$ Always
2 ./.	G Always
(mudic T(S,P) dT=(ST)df+(ST)dS	For ideal gas the
Set $ds = 0$ $dT = \left(\frac{\partial T}{\partial \rho}\right) d\rho$	For ideal gas   K T > Ks  Cp control  K = -1 (21)  T = -1 (21)  B is squared.
for cowland entirely	PV=NAT
(Adiabatic process) of Confession of Confess	$\left(\frac{\partial V}{\partial P}\right)_{T}^{2} = \frac{V}{P} \Rightarrow \frac{V}{T} = \frac{1}{P}$
$dv = \frac{(3v)}{\delta \rho} d\rho + \frac{(3v)}{\delta \rho} \frac{(3T)}{\delta \rho} d\rho$	and $K_s = \frac{1}{YP} \frac{\sin \frac{C_P}{C_Y}}{c_Y}$ . $(P:1:39 \text{ Chr.} \pm) \cdot \frac{\& K_T}{K_S} = Y$
with his a war by P which to be have	(P:1.39 ch.1). Also Kr = Y
(av) = (av) + (av) or's	K-Ks=TVB for ideal gras
	$\frac{1}{1-\frac{1}{\sqrt{2}}} = \frac{1}{p}\left(1-\frac{1}{\gamma}\right) = \frac{1}{p}\left(\frac{y-1}{\gamma}\right)$
Sum 1/2V -VK = VK + VB(8T)	$=\frac{1}{\rho}\left(\frac{\frac{f+2}{p}}{\frac{f}{p}}\right)=\left(\frac{1}{\rho}\left(\frac{2}{f+2}\right)\right)$
	++2 = (P (+2))
2 K = -1 (24) K - K = P(DP) S	While B= 1 ( DV ) = 1 2 (NAT) = NA - 1
S = V OP'S	$C_p = \frac{f}{2}Nh + Nh = \left(\frac{f+2}{2}\right)Nh.$
God HEUril 3 diff Tast Vap Go timed N	
(Know youth of Spile	$\frac{c_p}{(f+2)Nh} \frac{TNh(f+2)}{TNh(f+2)}$
(now youth of the post of post	Twelt 1/2 = (1./2)
	Therefore Type = (1/2)  Ky = Ks - Cp  Ky = Ks - Cp  Works for ideal gals  Sameas Ky - Ks .
$\left( = \frac{(\partial V)}{\partial T}, \frac{(\partial T)}{(\partial S)} \right)$	) works by a Sameas K-Ks.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	THE PARTY OF THE P

Bar Trans	a monoatomic ideal gas (Section 3.5) Shaw how to Calculate M. few monoatomic gas.
Fitneyly.	$NH = G  \sigma \mu = \frac{G}{N}  \frac{\partial H}{\partial \rho} = \frac{1 - \partial G}{N  \partial \rho}$
there days	$\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P} = \frac{V}{N} \frac{\partial G}{\partial P} = V$ $\frac{\partial \mathcal{A}}{\partial P}$
	$\frac{-h!}{P} = \frac{hv}{P} = \frac{hv}{P}$
heepig Tom	$\int \partial A(T,P) = hT \int \frac{\partial P}{\partial P}$
existent pil	$\Rightarrow \mu(\overline{I}, P) - \mu(\overline{I}, P) = h \overline{I} ln(\frac{\overline{I}}{P})$
(Eq: 5.40	M(T,P) = Mo(T) + MATERIAL TENTON SE at room Tenton  No se at P-Atim-Presen
Fre	m Section 3.5, we have $\mu = -hT \ln \left[ \frac{\sqrt{(25mhT)^{3/2}}}{h^2} \right]$ we can replace.
	Mullodyryk Diny by to usech the low Latter [ to the (2 minh) 32]
4	= - LTLU [KT(21711/2) + LTLA(P/A) - (ML)
Buth is it	This is soular to Ex (5-40) where MO(T) = - 12 Tln ( 15 (211 m LT) 3/2
(28 4 5, 22 log)	Me Cay with M(TP) = No(T) + Let ln( PP, ) Sam as ex (5 40)
	Sam as ey
Lapid to	adoute my many and a start of a start of a second of the s
Ceyona.	to call the

1 E 22 2 1 1 2 2 1