	V-1								
	:KEY	Official Cla	ıss:	1	Date:	······································			
Teach	ner:	Period:							
	Heat of	f Reaction (a.k.a Ent	thalp	y)					
that re	D: Directions: Read the claim. We lates to the claim below (Evidential of the claim below (Evidential of the claim). Our evider oning).	nce) [HINT: the emoji to the righ	ht.] The	en, write	2	53			
•	Claim: Breaking bonds are considered to be exothermic positions.  Evidence:  O Preak Absorb	rocesses:	ocesse	s and for	ming bond	ls are			
•	• Reasoning:  o Inorder for a bond to break, energy must be absorbed. An enduthermic process is when energy is absorbed. Oppositely, when bonds form, energy is released. Exothermic processes occor when energy is released.								
Heat o	of Reaction	1.01.000.000.000.000	+ 400	ICO act	101 -				
Endot	$\Delta H_{\text{heat of reaction}} = H_{\text{products}} - H_{\text{reacta}}$ $\Delta H = \underbrace{\text{entalp4}}_{\text{chermic Reactions}}$	y lostorgained throughou			thermic F	leaction			
•	Heat is <u>absorbed</u> by o Energy is stored in chem o <u>AH IS (+)</u> o At B + energy >	nical bonds of the products		37	Reactants with less stored	Products with			
Endot	hermic Example $A + B \rightarrow C$		_		energy	, energy			
•	If $H_A = 40$ kJ and $H_B = 20$ kJ, then	n the reactants have a total or 60	0 kJ	ē.					
•	If $H_C = 110$ kJ, then 50 kJ of heat 0 (110-60 = 50kJ) 0  Rewritten: A + B + 50 kJ	must have been absorbed by t		ctants.	ar e				

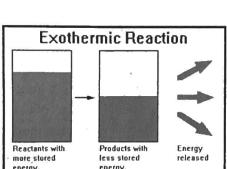
 Total energy on both sides are equal (law of conservation of energy)

## **Exothermic Reactions**

- Heat is released as a product
  - o DH IS C-)
  - o More stable reaction
  - o Spontaneous
  - o A+13 > C+D + energy
    - Energy is written as a product

## Exothermic Example $A + B \rightarrow C$

- If  $H_A = 60 \text{ kJ}$  and  $H_B = 40 \text{ kJ}$ , then the reactants have a total of 100 kJ
- If  $H_C = 30$  kJ, then 70 kJ of heat must be released as a product
  - $\circ$  (100-30 = 70)
  - Rewritten:  $A + B \rightarrow C + 70 \text{ kJ}$
- Total energy on both sides are equal (law of conservation of energy)



Name:		KET		Date:				
Teacher: _		01D 1000 W	Period:	Class:				
Table I: He	at of Reaction at 101.	3 kPa and 298 K	tod in the	austions A minus sign indic	ates			
		d on molar quantitie	es represented in the e	equations. A minus sign indic				
	xothermic reaction							
• Two ways to write + $\Delta$ H (an ENDOTHERMIC REACTION) • $N_{2(g)} + O_{2(g)} \rightarrow 2NO_{(g)}[\Delta H + 182.6 \text{ kJ}]$								
	$182.6 \text{ kJ} + N_{2(g)} +$		TA CITIONS					
	ways to write - ΔH (a							
		$CO_{2(g)} + 2H_2O_{(l)}$ [ACO <sub>2(g)</sub> + 2H <sub>2</sub> O <sub>(l)</sub> + 89		4.0				
(	$CH_{4(g)} + 2O_{2(g)} \rightarrow$	$CO_{2(g)} + ZI_{12}O_{(1)} + O_{3}$	70.1 KJ	,				
Duestion So	cenarios Using Table	I						
• If the	e reaction in the que	stion matches Table	I exactlyjust use the	e ΔH value given				
<ul> <li>If the</li> </ul>	e reaction in the que	stion is OPPOSITE o	f Table Ichange the :	sign of ΔH				
• If the	e reaction in the que	stion shows double	the amount of each par	rt of the reactiondouble $\Delta H$				
• If the	e reaction in the que	stion shows HALF th	e amount of each part	of the reactionhalf $\Delta H$				
	-		. an					
Things to R	emember:		_ :.					
• Are	action is exothermic	if		n is endothermic if				
(	It releases heat			absorbs heat eat is added				
(	Heat is produced			I is positive				
(	ΔH is negative			eat is written as a reactant				
(	Heat is written as	a product		341 10 11 11 11 11 11 11 11 11 11 11 11 11				
Otions V	What if the reaction is	the opposite of wha	at it says on Table I?	7 ) 6 25				
Juesnon, v	ot is the AH of the foll	owing reaction? Is t	his exothermic or end	othermic?				
	$2H_2O_{(1)} \to 2H_{2(g)} +$							
,	Table I says: 2Ho	$_{\alpha}$ + $O_{2(\alpha)} \rightarrow 2H_2O_{(1)}$	$\Delta H = -571.6$					
• Ansı	1 / V	1 Londa thormas	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	6 × 14				
	when reactions	are switched 1	reversed, switch	sign of All				
		*						
Sample Pro	blems	2.00						
1. Give	en the reaction 2CO	$O_{2(g)} \rightarrow \mathcal{I} \cup \mathcal{I}_{1}$	2. Given the	e reaction $2H_{2(g)} + O_{2(g)} \rightarrow 2H_{2(g)}$	20(1)			
	$p_{2(g)} \Delta H \neq -556.0 \text{ kJ}$		$\Delta H = -57$	- ,				
â	. How much heat w			alculate $\Delta H$ for the following				
	is 4 moles of carb			action: $H_{2(g)} + (\frac{1}{2}O_{2(g)} \rightarrow H_2O_{(1)}$	)			
	were consumed h	y oxygen?		rom re				
	ant while A	. 17	$\omega_{N_{\mathfrak{b}}}$	raictive )				
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8, ,	2 N 3	O IAND DRON	ENTHALPY IS	-571.6 = 1 28	5.8			
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	were consumed in the party of t			6.0				
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