

PART 1

SUBJECTIVE SCORE INSTRUCTOR USE ONLY

100	90	80	70	60
50	40	30	20	10
9	8	7	6	5
4	3	2	1	0

(T) (F) KEY

100 2 3

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E
41	A	B	C	D	E
42	A	B	C	D	E
43	A	B	C	D	E
44	A	B	C	D	E
45	A	B	C	D	E
46	A	B	C	D	E
47	A	B	C	D	E
48	A	B	C	D	E
49	A	B	C	D	E
50	A	B	C	D	E

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FEED THIS DIRECTION

6

06/07/08 MT2 1606 999 1211109 876

IMPORTANT

USE NO. 2 PENCIL ONLY

- MAKE DARK MARKS
- ERASE COMPLETELY TO CHANGE

EXAMPLE: A B C D E

TO USE SUBJECTIVE SCORE FEATURE:

- Mark total possible subjective points
- Only one mark per line on key
- 163 points maximum

EXAMPLE OF STUDENT SCORE:
1 2 3 4 5
100 90 80 70 60
50 40 30 20 10
9 8 7 6 5
4 3 2 1 0

SCANTRON
FORM NO. 882-E
FOR USE ON
TEST SCORING
MACHINE ONLY

NAME	Linethis
SUBJECT	4th 2008
DATE	
PERIOD	

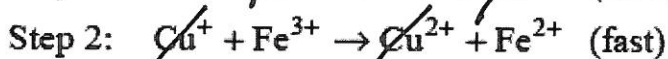
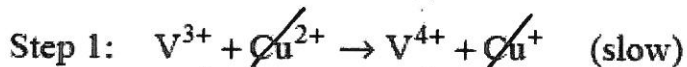
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TEST RECORD

PART 1	
PART 2	
TOTAL	

Part II: Written section – show all steps leading to the final solution. Sig. Dig's count!

1. Consider the following reaction mechanism for questions A-D:



A. Determine the overall reaction in the space provided above. (2 marks)

B. Identify all reaction intermediates/catalysts. (1 mark each)

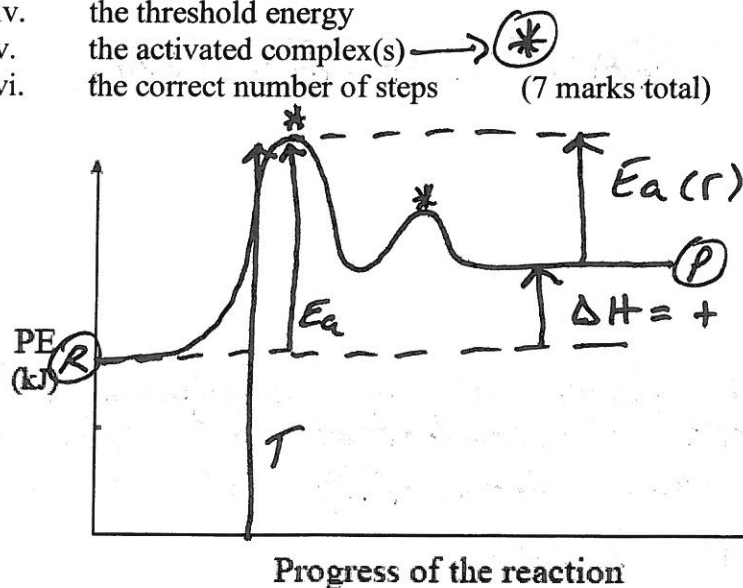
Rxn. Intermediate (Cu^{+}) Catalyst (Cu^{2+})

C. Indicate which step is the rate determining step. (1 mark)

STEP #1 (It's slow)

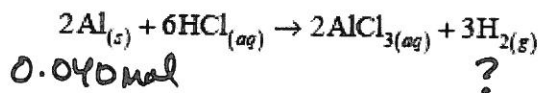
D. In the space below, draw a potential energy diagram which shows:

- the relative changes in energy as the reaction above proceeds (assuming that the reaction is endothermic).
- the E_a and the $E_a(\text{rev})$
- the ΔH and the sign (+ or -)
- the threshold energy
- the activated complex(s) → *
- the correct number of steps (7 marks total)



2.

Consider the reaction:



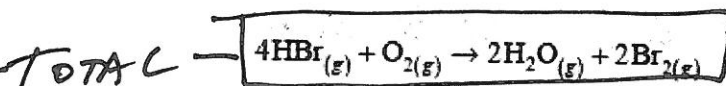
A 0.040 mol piece of aluminum reacted completely in 20.0s. Calculate the rate of formation of hydrogen gas in g/s. (3 marks)

$$\frac{\text{Al}}{\text{H}_2} \quad \frac{2}{3} = \frac{0.040 \text{ mol}}{x} = 0.060 \text{ mol} \quad (1)$$

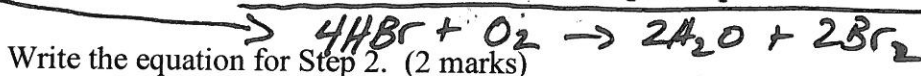
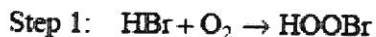
$$\text{H}_2 \quad \frac{2.0 \text{ g}}{1 \text{ mol}} = \frac{x}{0.060 \text{ mol}} = 0.12 \text{ g} \quad (1)$$

$$\frac{0.12 \text{ g}}{20 \text{ s}} = \frac{x}{1 \text{ s}} = 0.0060 \text{ g/s} \quad (1)$$

3. Consider the overall reaction:



A proposed three-step reaction mechanism is:



Write the equation for Step 2. (2 marks)

4. Explain *using collision theory* why reactions tend to be faster at the beginning and slow down over time. (1 mark)

Reactions are faster at the beginning b/c reactants are most concentrated at the beginning = making the probability of a successful collision higher

5. Which factor could be responsible for causing the change in particle distribution from graph #1 to graph #2? (1 mark)

