

Chemistry 351

Quiz #5

October 3, 2018

Name: _____

Student Number: _____

Section Number: _____

TA: _____

INSTRUCTIONS:

This quiz consists of 9 questions on 3 pages. Please make certain that your quiz is complete.

Write your name, student number, and section number **on both the quiz and answer sheet. Be certain to bubble in your PID digits on the answer sheet. The absence of any of these identification items will result in the deduction of 2 points from your score.**

Questions 1 - 8 are each worth 1 point. Question 9 is worth 2 points.

Write your answers to Questions 1-8 on the enclosed answer sheet. **Write your answers to Question 9 in the space provided on this quiz.**

When you complete the quiz, insert your answer sheet into your quiz and then hand both in on the bench in front of the lecture hall in the spot indicated by your section number.

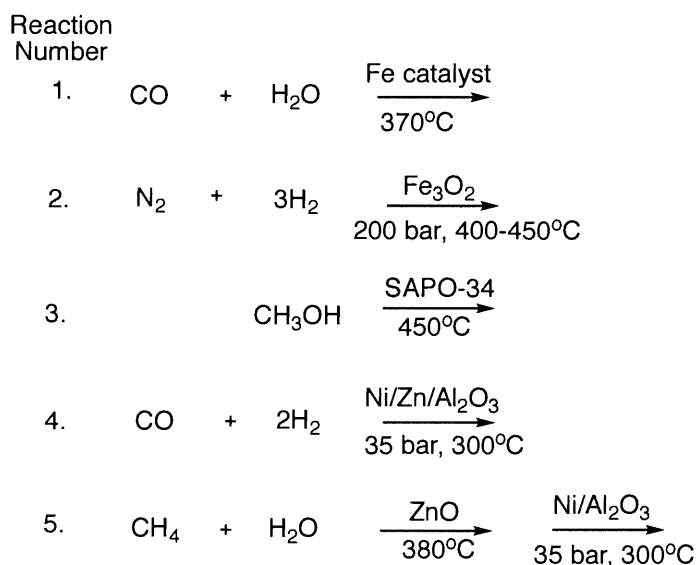
1. What molecule constitutes 5% of the composition of Marcellus shale gas?

- (a) N₂ (b) *n*-butane (c) CO₂ (d) propane (e) isobutane (f) ethane
 (g) isopentane (h) pentane (i) methane

2. What are the estimated U.S. reserves of methane hydrate?

- (a) 12 x 10⁹ m³ (b) 0.76 x 10¹² m³ (c) 10 x 10¹² m³ (d) 46 x 10⁹ m³
 (e) 70 x 10¹² m³ (f) 1,500 x 10¹² m³ (g) 0.77 x 10¹² m³ (h) 60 x 10⁹ m³

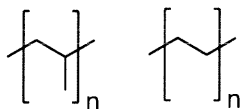
Question 3 and Question 4 are to be answered from the following reactions:



3. Identify the two reactions that provide 50-75% of the N atoms in your body.

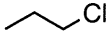
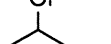
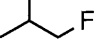
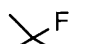
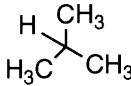
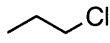
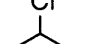
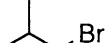
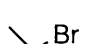


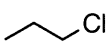
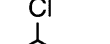
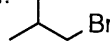
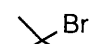
- a. 1,2 b. 1,3 c. 1,4 d. 1,5 e. 2,3 f. 2,4 g. 2,5 h. 3,4 i. 3,5 j. 4,5

4. Identify the three reactions that are being used in the People's Republic of China to synthesize the following molecules from methane:

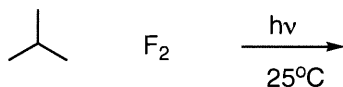


- a. 1,2,3 b. 1,3,4 c. 1,4,5 d. 2,3,4 e. 2,4,5 f. 3,4,5

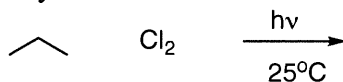
Questions 5-8 are to be answered from the following possibilities:

<p>A.</p>  75%  25%	<p>B.</p> $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_3$	<p>C.</p>  14%  86%	<p>D.</p> 	<p>E.</p>  43%  57%
<p>F.</p>  1%  99%	<p>G.</p>  86%  14%	<p>H.</p>  10%  90%	<p>I.</p>  90%  10%	<p>J.</p> $\text{H}_3\text{C}-\text{CH}_3$

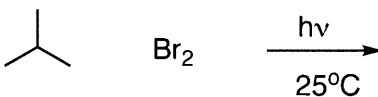
5. Identify the products and products' yields formed in the following reaction:



6. Identify the products and products' yields formed in the following reaction:

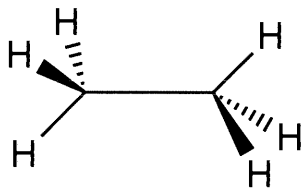


7. Identify the products and products' yields formed in the following reaction:



8. Identify the hydrocarbon that during free-radical halogenation can generate a carbon-localized radical stabilized by hyperconjugation with 6 C-H sigma bonds.

9. (2 pts) In the labeled box provided below, draw the Newman Projection of the indicated ethane conformation:



Newman Projection