Last Name	First Name	MI
Student ID Number:		Total Score
Circle the name of your TA: PHIL ADAM CARI HEATHER		
Discussion Section – Day: Time:		/ 30

Chem 30A Fall 2004

QUIZ #1A Key

(15 Min)

Weds October 13th

INTERPRETATION OF THE QUESTIONS IS PART OF THE EXAM – DO NOT ASK FOR THE QUESTIONS TO BE EXPLAINED TO YOU

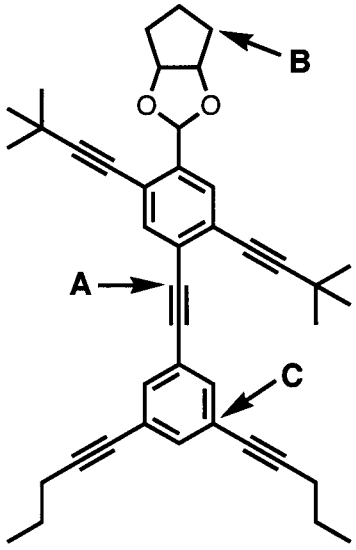
ONLY ANSWERS WRITTEN IN THE BOXES PROVIDED WILL BE GRADED

****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO****

Q1	
Q2	
Total	

"And how is education supposed to make me feel smarter? Besides, every time I learn something new, it pushes some old stuff out of my brain. Remember when I took that home winemaking course, and I forgot how to drive? - Homer Simpson

1. In perhaps some of the most inane chemical research ever performed, Jim Tour and his research group at Rice University made some molecules that look like people. How cute. He calls them the 'NanoPutians'. How cute. Please answer the questions below about '**NanoJester**' – the molecule drawn in line formula below. (23 points)



What is the total number of carbon atoms? (4 points) 42

What is the total number of hydrogen atoms? (4 points) 46

What is the total number of sp^3 hybridized atoms? (4 points) 22

What is the hybridization of carbon atom **A**? (2 points) sp

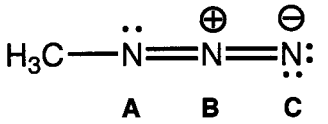
What is the hybridization of carbon atom **B**? (2 points) sp^3

What is the hybridization of carbon atom **C**? (2 points) sp^2

What is the total number of electron lone pairs? (2 points) 4

What is the total number of π bonds? (3 points) 16

2. (a) For the structure shown below, what is the hybridization state of atoms **A**, **B**, and **C**, as drawn? (6 points)

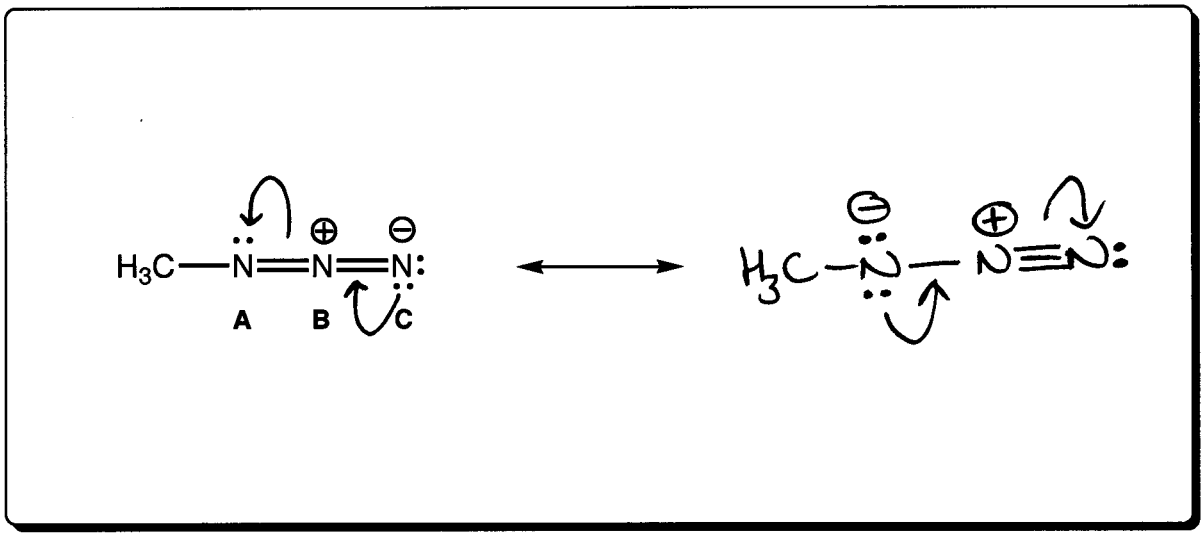


Hybridization of **A** sp^2

Hybridization of **B** sp

Hybridization of **C** sp^2

(b) Draw a reasonable resonance contributor IN WHICH ATOMS **A**, **B** and **C**, ALL HAVE A FULL OCTET, showing the arrows you need to convert EACH resonance form into the other. In the structure you draw, include all formal charges and lone pairs. (6 points)



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Chem 30A Fall 2004

QUIZ #1B KEY

(15 Min)

Weds October 13th

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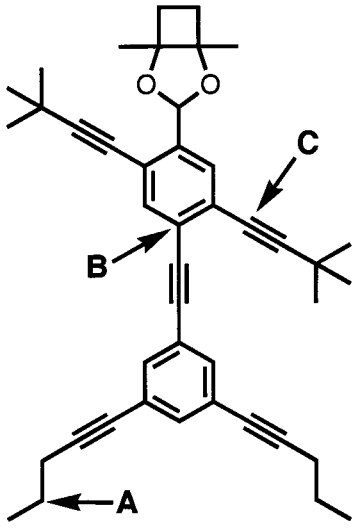
Q1	
Q2	
Total	

"And how is education supposed to make me feel smarter? Besides, every time I learn something new, it pushes some old stuff out of my brain. Remember when I took that home winemaking course, and I forgot how to drive? - Homer Simpson

1. In perhaps some of the most inane chemical research ever performed, Jim Tour and his research group at Rice University made some molecules that look like people. How cute. He calls them the 'NanoPutians'. How cute. Please answer the questions below about '**NanoPilgrim**' – the molecule drawn in line formula below. (23 points)



What is the total number of carbon atoms? (4 points) 43

What is the total number of hydrogen atoms? (4 points) 48

What is the total number of sp^3 hybridized atoms? (4 points) 23

What is the hybridization of carbon atom **A**? (2 points) sp^3

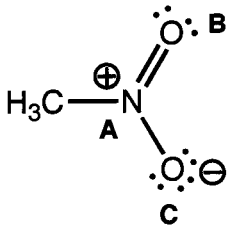
What is the hybridization of carbon atom **B**? (2 points) sp^2

What is the hybridization of carbon atom **C**? (2 points) sp

What is the total number of electron lone pairs? (2 points) 4

What is the total number of π bonds? (3 points) 16

2. (a) For the structure shown below, what is the hybridization state of atoms **A**, **B**, and **C**, as drawn? (6 points)

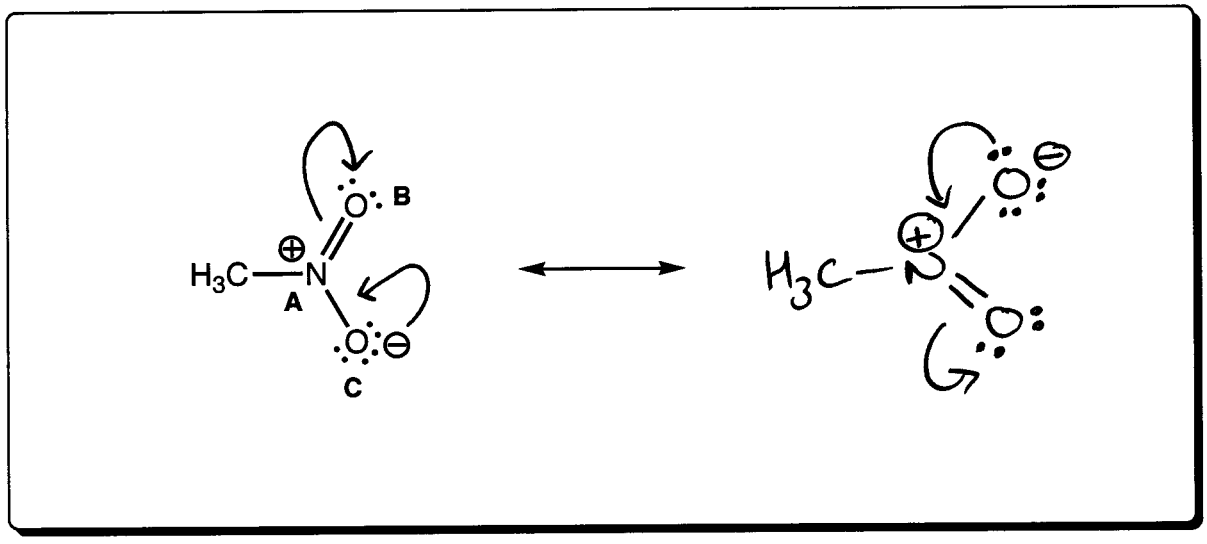


Hybridization of **A** sp^2

Hybridization of **B** sp^2

Hybridization of **C** sp^3

(b) Draw a reasonable resonance contributor IN WHICH ATOMS **A**, **B** and **C**, ALL HAVE A FULL OCTET, showing the arrows you need to convert EACH resonance form into the other. In the structure you draw, include all formal charges and lone pairs. (6 points)



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Chem 30A Fall 2004

QUIZ #1C KEY

(15 Min)

Weds October 13th

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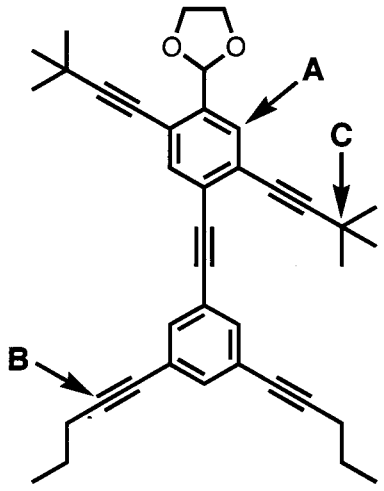
****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO****

Q1	
Q2	
Total	

"And how is education supposed to make me feel smarter? Besides, every time I learn something new, it pushes some old stuff out of my brain. Remember when I took that home winemaking course, and I forgot how to drive? - Homer Simpson

1. In perhaps some of the most inane chemical research ever performed, Jim Tour and his research group at Rice University made some molecules that look like people. How cute. He calls them the 'NanoPutians'. How cute. Please answer the questions below about '**NanoKid**' – the molecule drawn in line formula below. (23 points)



What is the total number of carbon atoms? (4 points) 39

What is the total number of hydrogen atoms? (4 points) 42

What is the total number of sp^3 hybridized atoms? (4 points) 19

What is the hybridization of carbon atom **A**? (2 points) sp^2

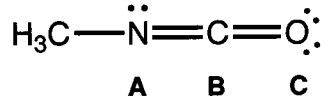
What is the hybridization of carbon atom **B**? (2 points) sp

What is the hybridization of carbon atom **C**? (2 points) sp^3

What is the total number of electron lone pairs? (2 points) 4

What is the total number of π bonds? (3 points) 16

2. (a) For the structure shown below, what is the hybridization state of atoms **A**, **B**, and **C**, as drawn? (6 points).



Hybridization of **A** sp^2

Hybridization of **B** sp

Hybridization of **C** sp^2

(b) Draw a reasonable resonance contributor IN WHICH ATOMS **A**, **B** and **C**, ALL HAVE A FULL OCTET, showing the arrows you need to convert EACH resonance form into the other. In the structure you draw, include all formal charges and lone pairs. (6 points)