Announcements – Lecture XII – Thursday Oct 17th

1. **Lab 3 – Saturday, October 19th, 1:00-4:00 pm – ISB 155/160 A-E**
   Lab Owl II – Deadline – Saturday, October 19th, 11:59 pm

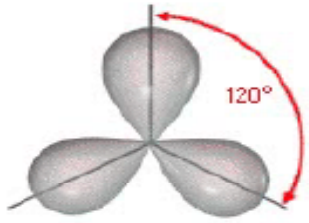
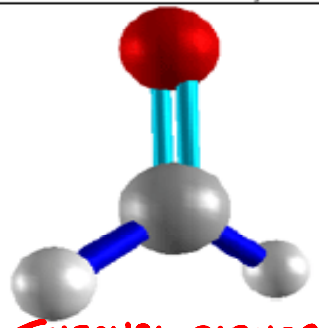
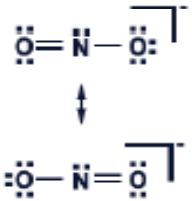
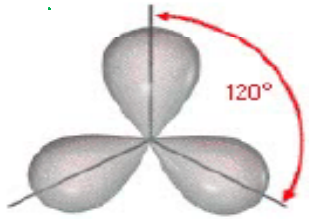
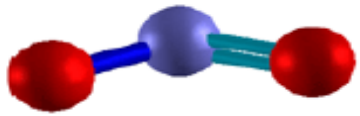
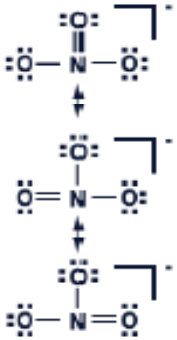
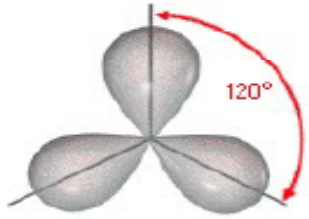
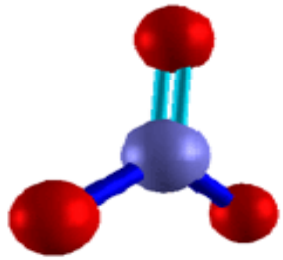
3. 

   iClicker:
   Choose any letter: A-E

A Typical New England Sunday

3.10 Molecular Geometries and Bond Angles

Molecular Geometry Worksheet ... Fall 2008 ... Whelan ... Page 2

Lewis Structure	Classification	X+E	Parent Geometry	Molecular Geometry	Bond Angle	Polarity
H_2CO 	AX_3E_0	3	 TRIGONAL PLANAR	 TRIGONAL PLANAR	120°	
NO_2^- 	AX_2E_1 AX_2E_1	3 3	 TRIGONAL PLANAR	 ANGULAR/BENT 120°	120°	
NO_3^- 	AX_3E_0 AX_3E_0 AX_3E_0	3 3 3	 TRIGONAL PLANAR	 TRIGONAL PLANAR	120°	

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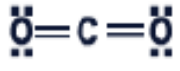
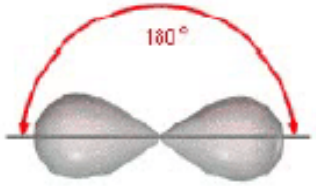
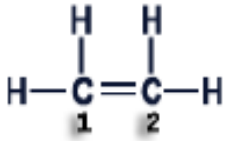
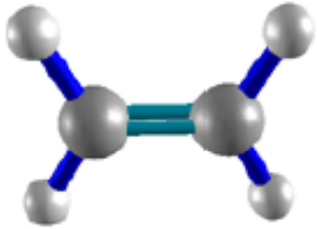
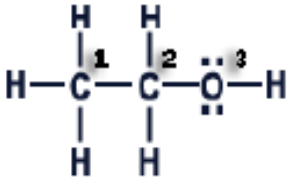
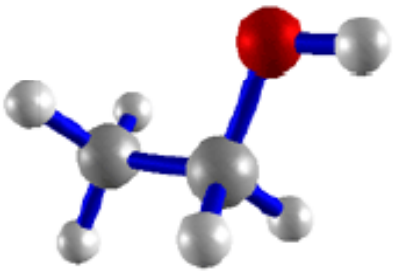
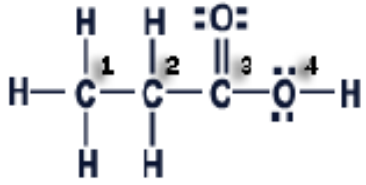
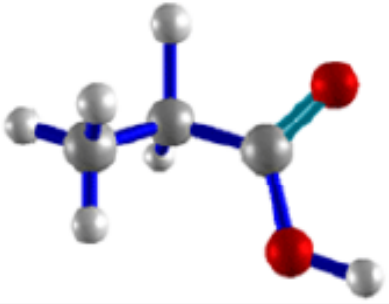
Molecular Geometry Worksheet … Fall 2008 … Whelan … Page 3

Lewis Structure	Classification	X+E	Parent Geometry	Molecular Geometry	Bond Angle	Polarity
CO_2 	AX_2E_0	2	 LINEAR	 LINEAR	180°	
C_2H_4 	1: AX_2E_0 2: AX_2E_0	3 3	1: TRIGONAL PLANAR 2: TRIGONAL PLANAR		1: 120° 2: 120°	
C_2H_5OH 	1: AX_4E_0 2: AX_4E_0 3: AX_2E_2	4 4 4	1: TETRAHEDRON 2: TETRAHEDRON 3: TETRAHEDRON		1: ~109° 2: ~109° 3: ~109°	
C_2H_5COOH 	1: AX_4E_0 2: AX_4E_0 3: AX_3E_0 4: AX_2E_2	4 4 3 4	1: TETRAHEDRON 2: TETRAHEDRON 3: TRIGONAL PLANAR 4: TETRAHEDRON		1: ~109° 2: ~109° 3: 120° 4: ~109°	

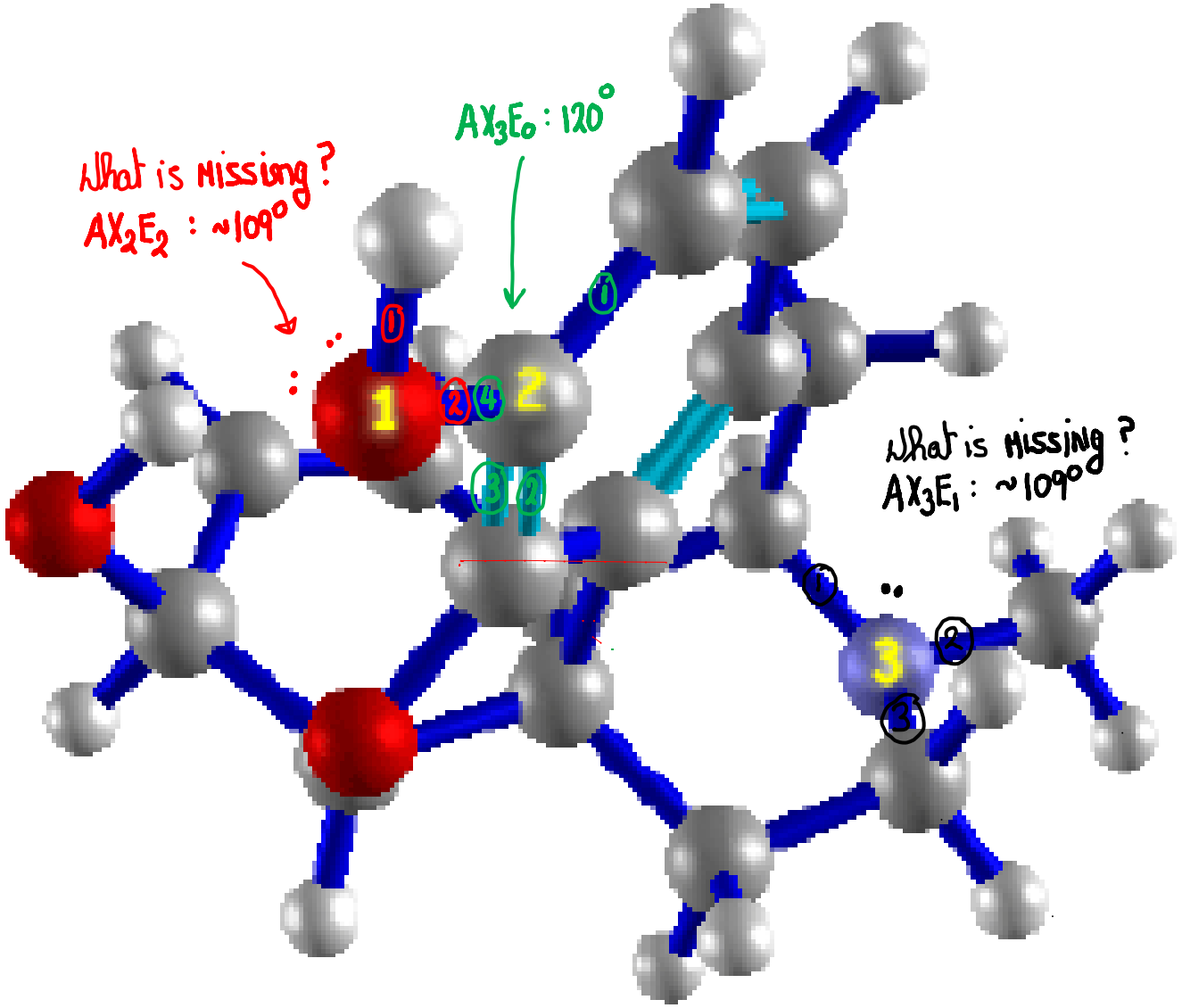
3.10 Molecular Geometries and Bond Angles

Summary

	Electron Pair Geometry		Molecular Geometry
X+E = 4	Tetrahedron (~109°)	E = 0	Tetrahedron
		E = 1	Trigonal pyramid
		E = 2	Angular / Bent ~109°
X+E = 3	Trigonal planar (120°)	E = 0	Trigonal planar
		E = 1	Angular / Bent 120°
X+E = 2	Linear (180°)	E = 0	Linear

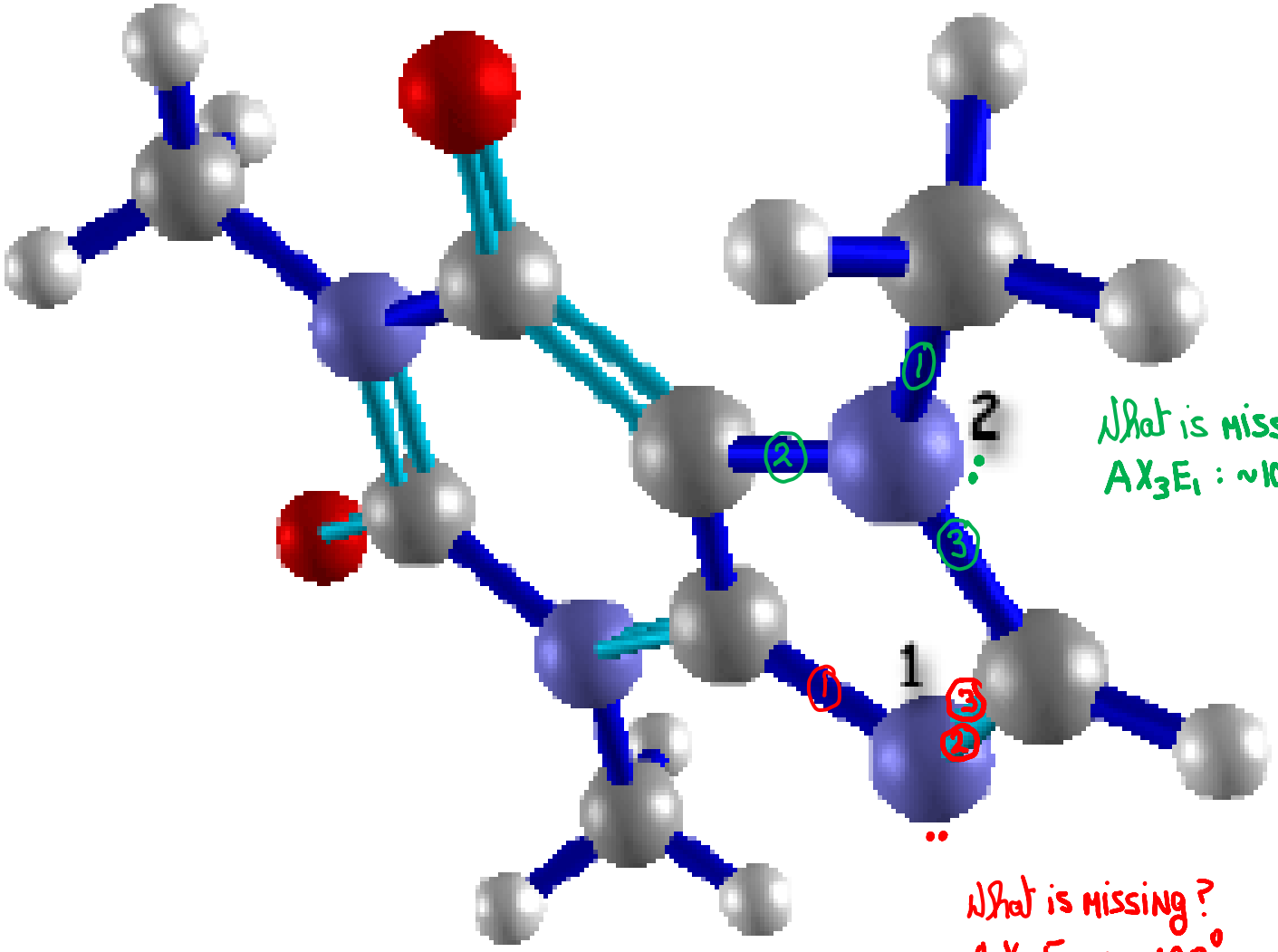
3.10 Molecular Geometries and Bond Angles

Morphine



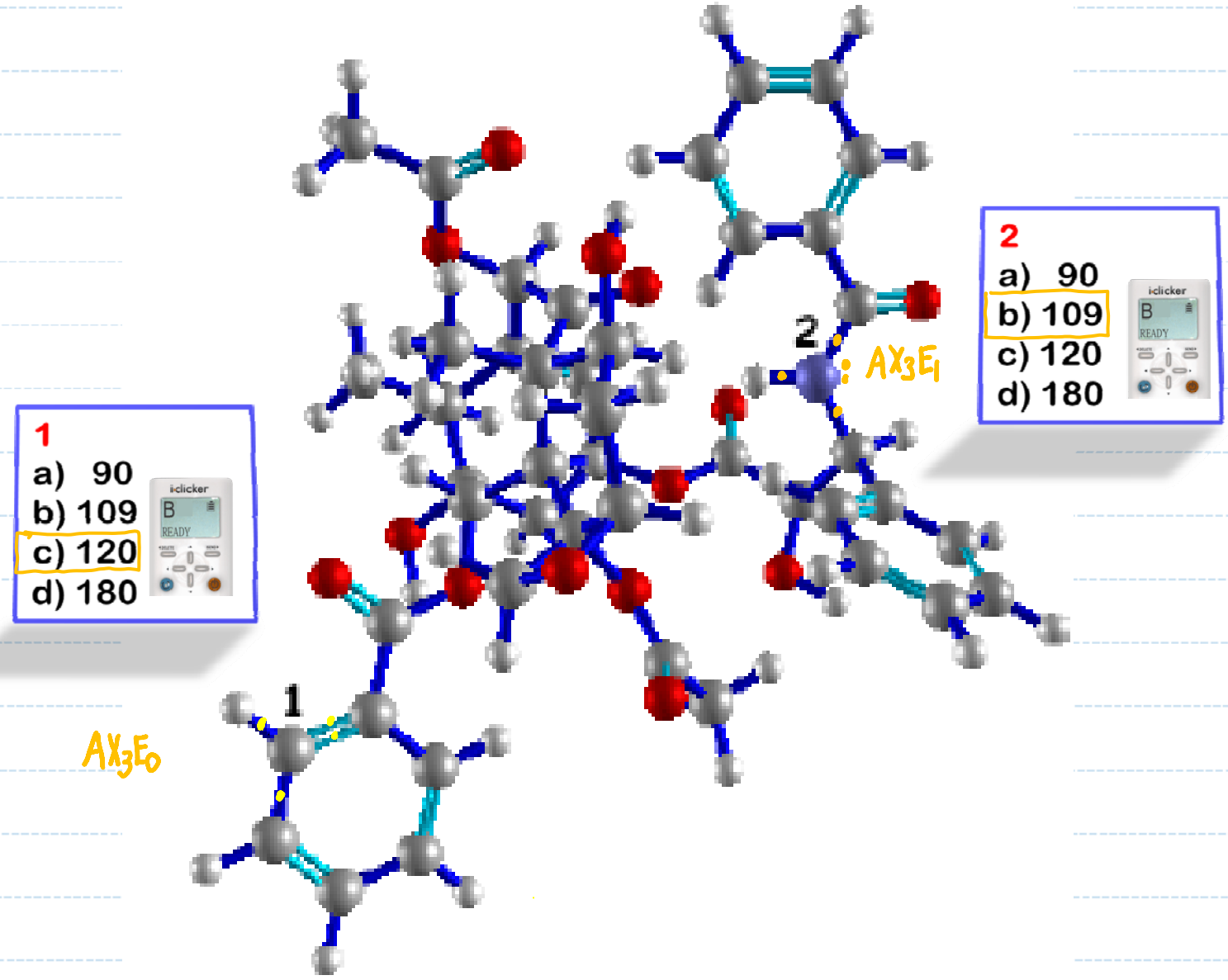
3.10 Molecular Geometries and Bond Angles

Caffeine



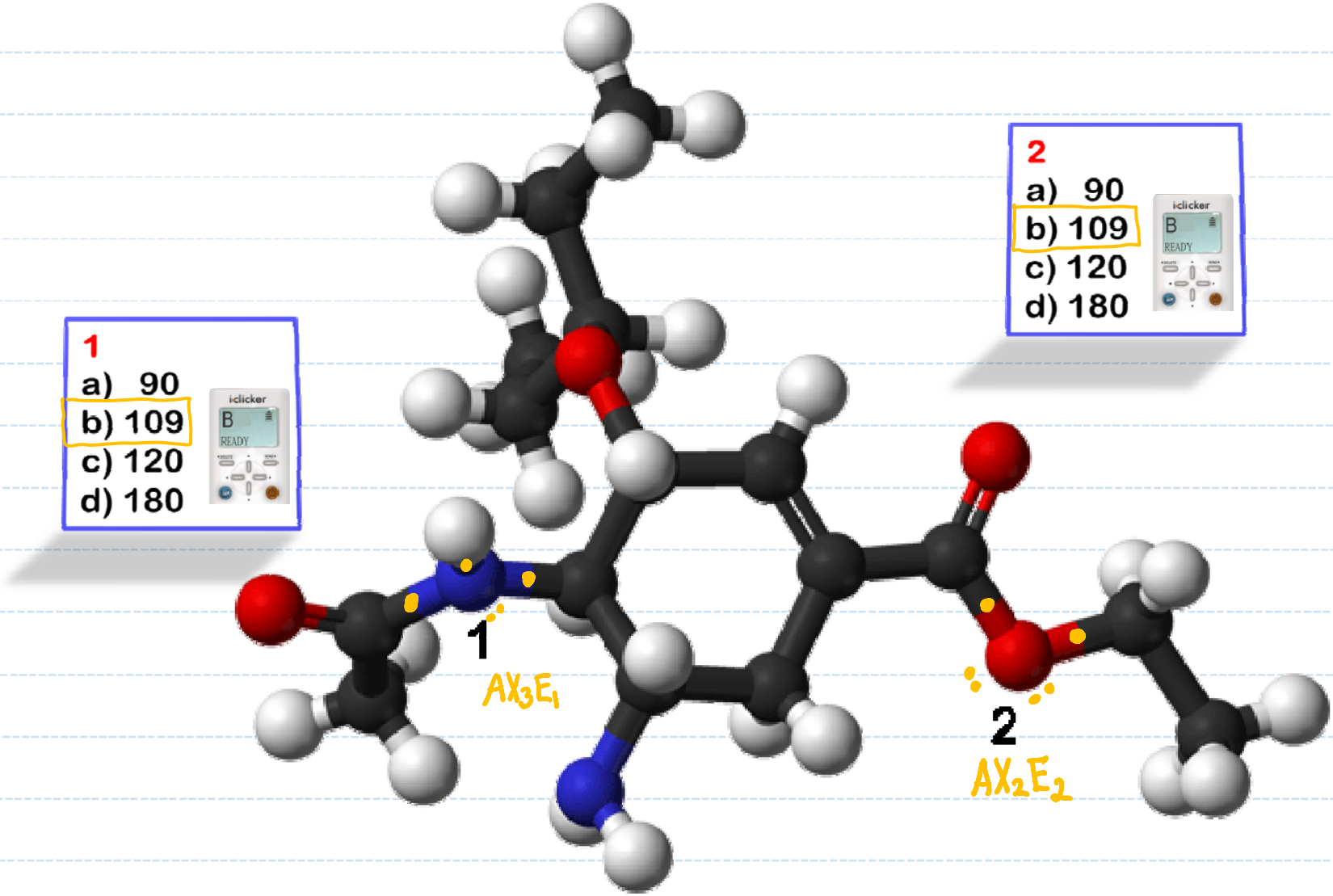
3.10 Molecular Geometries and Bond Angles

Taxol



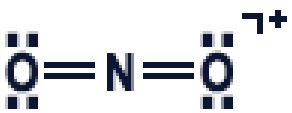
3.10 Molecular Geometries and Bond Angles

Tamiflu



3.10 Molecular Geometries and Bond Angles

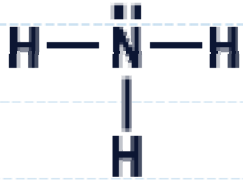
a



b

c

d



Which of the above molecules has the smallest bond angle?

a	b	c	d
AX_2	AX_2E_1	AX_2E_2	AX_3E_1
Linear	Trigonal planar	Tetrahedron	Tetrahedron
180°	120°	~ 109°	~ 109°
		2 lone pairs	1 lone pair