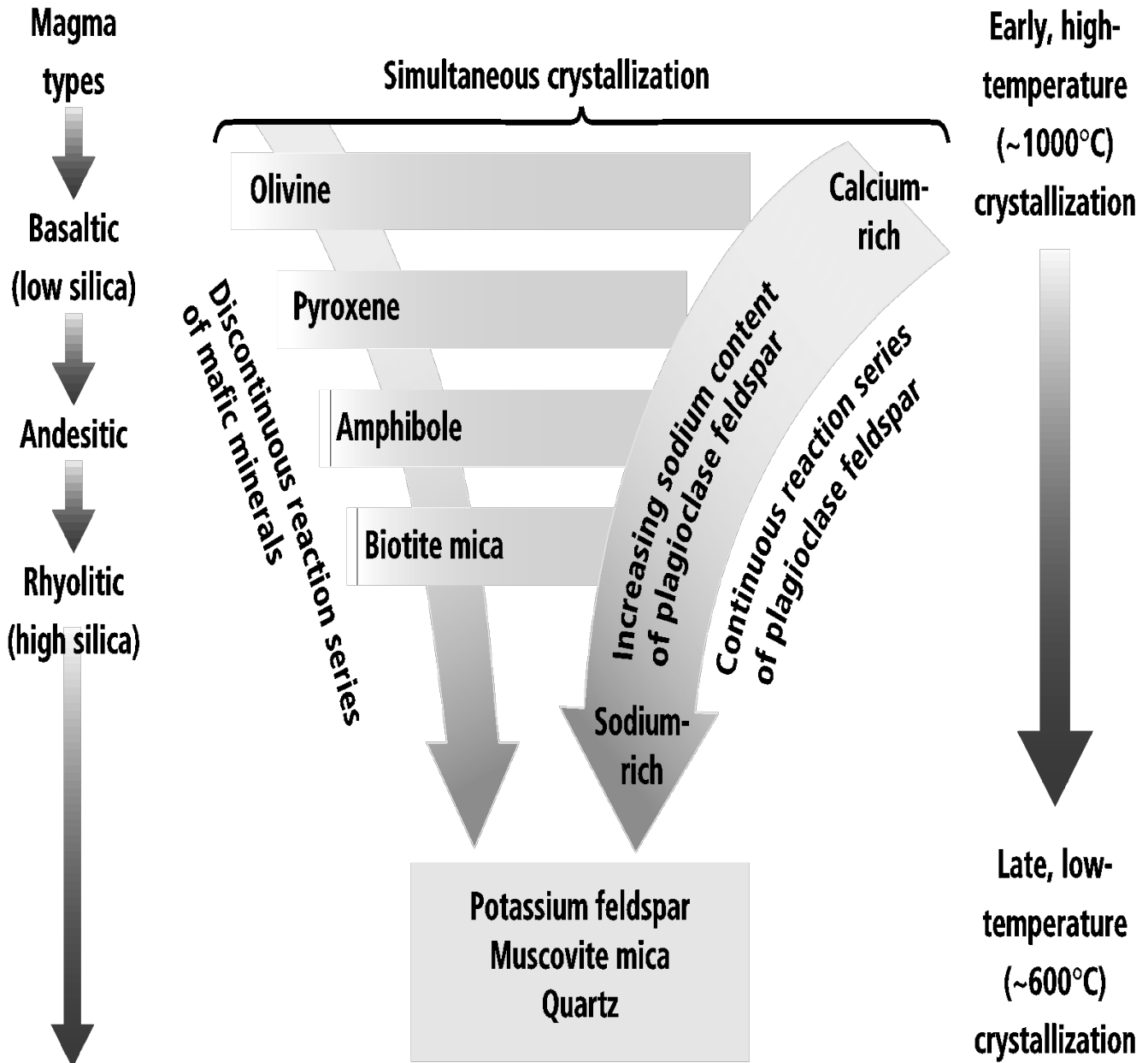


Name \_\_\_\_\_

# BOWEN'S REACTION SERIES



## BOWEN'S REACTION SERIES

1. In Bowen's reaction series, how do the two main branches of crystallization differ?

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2. As magma cools, which are the first feldspars to crystallize?

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3. Describe the composition of a zoned crystal that developed during feldspar crystallization. What caused it to form? Hint: page 115

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4. As magma cools, what is the first iron-rich and calcium-rich minerals to crystallize?

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5. Which crystallizes at a higher temperature—amphibole or pyroxene?

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6. What happens to amphibole when temperatures drop? Describe 2 things.

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7. What elements remain in the melt at towards the end of the reaction series? What forms when this melt finally crystallizes?

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## **Bowen's Reaction Series**

1. One branch is characterized by a continuous, gradual change of feldspar minerals; the other branch is characterized by an abrupt change of minerals rich in iron and magnesium.
2. The first feldspars to crystallize are calcium-rich feldspars.
3. A zoned crystal has sodium-rich outer layers and a calcium-rich core. It can form when magma cools rapidly and the calcium-rich crystal core is unable to react completely with the magma.
4. olivine
5. pyroxene
6. A new mineral, biotite, is formed.
7. The remaining melt contains silica and oxygen, and forms quartz.