**Quiz 6**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

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| --- | --- |
| Substance | ∆Gf° (kJ/mol) |
| CH3OH (l) | -166 |
| CO (g) | -137 |
| H2 (g) | 0 |

1. One method for synthesizing methanol, CH3OH, involves reacting carbon monoxide and hydrogen gases:

CO (g) + 2 H2 (g) → CH3OH (l) (12 points).

* 1. Use the following data to calculate ∆G° in kJ/mol rxn for the reaction.
  2. What is ∆G of the reaction at 25 °C, if 3.0 atm of carbon monoxide reacts with 5.0 atm of hydrogen gas?

1. What are the three types of reaction in the Analysis of a Cation Mixture (3 points)?
2. Formation of an insoluble salt (precipitation reaction)
3. Formation of ammine complex ion
4. Formation of hydroxide complex ion (amphoteric cations)