CONCEPT: PEPTIDE SEQUENCING: PARTIAL HYDROLYSIS BY CYANOGEN BROMIDE

- Cyanogen Bromide (BrCN) _____ cleaves peptide bonds on the carboxyl group of _____.
  - □ Higher specificity than enzymes and has ____ exceptions.

EXAMPLE: Cyanogen bromide was used to cleave an unknown peptide. Propose a possible peptide sequence given the following fragments. (Hint: there are no Met-Met peptide bonds).

Gly-Ser-Thr-Met Met Ala-Lys-Phe

Cyanogen Bromide Partial Hydrolysis Mechanism

1. **S_N2 Reaction:** Nucleophilic ___ attacks C of BrCN, kicking out ___.
   - Forms a sulfonium ion (_____ leaving group).
2. **S_N2 Reaction**: Carbonyl O attacks γ-___ in an intramolecular S_N2 reaction, kicking out methyl _____cyanate.
   - Forms a ___-membered methionine derivative ring.
3. **Hydrolysis:** acid catalyzed hydrolysis of imine _____ methionine derivative from peptide chain (Pep^C).

Partial Hydrolysis by Cyanogen Bromide