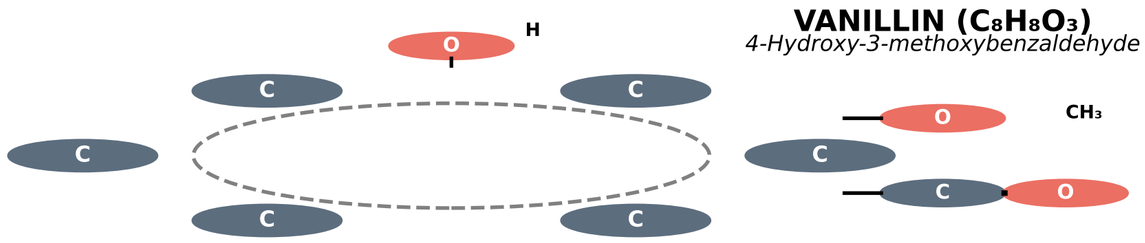
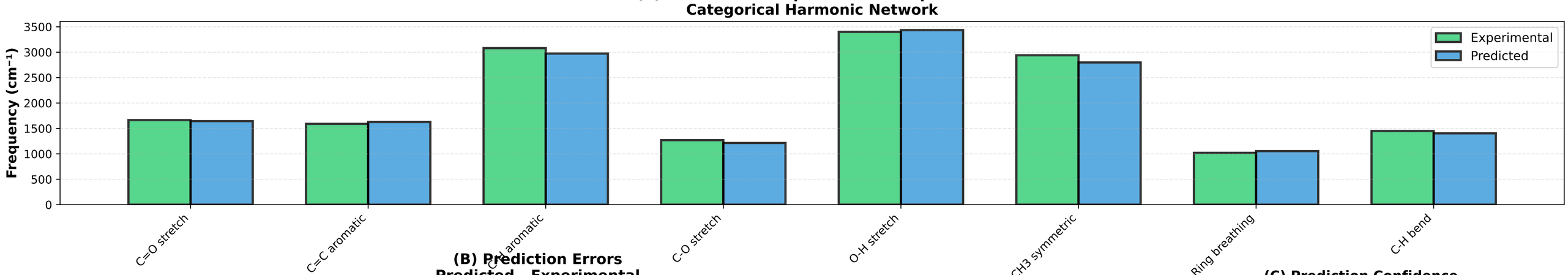
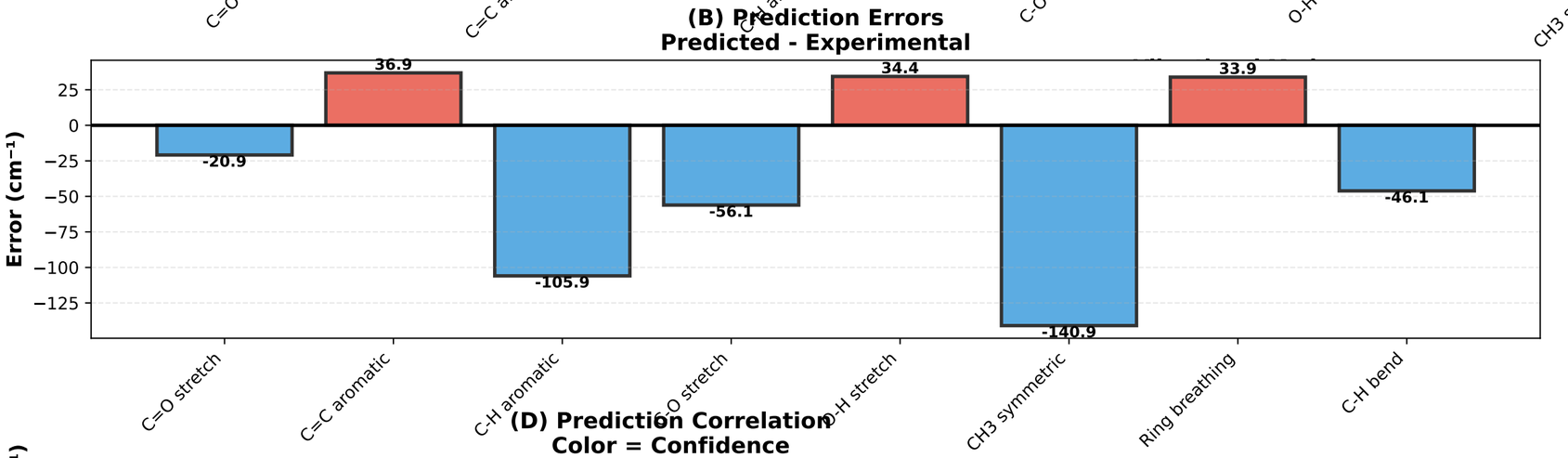
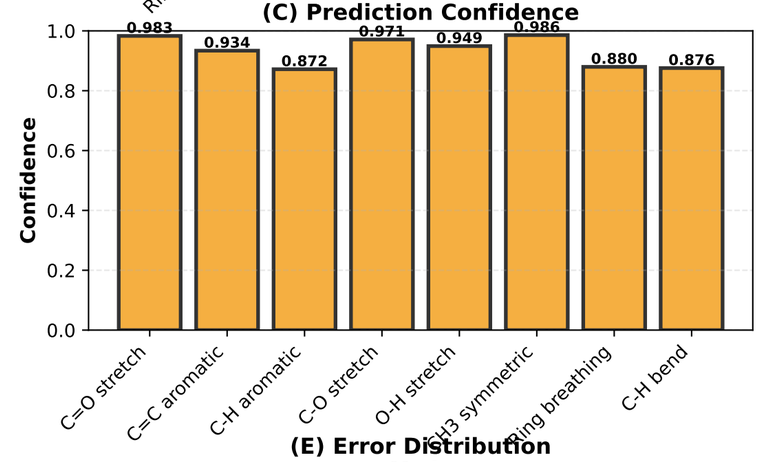
# Vanillin Molecular Structure Prediction
# Categorical Harmonic Network Analysis

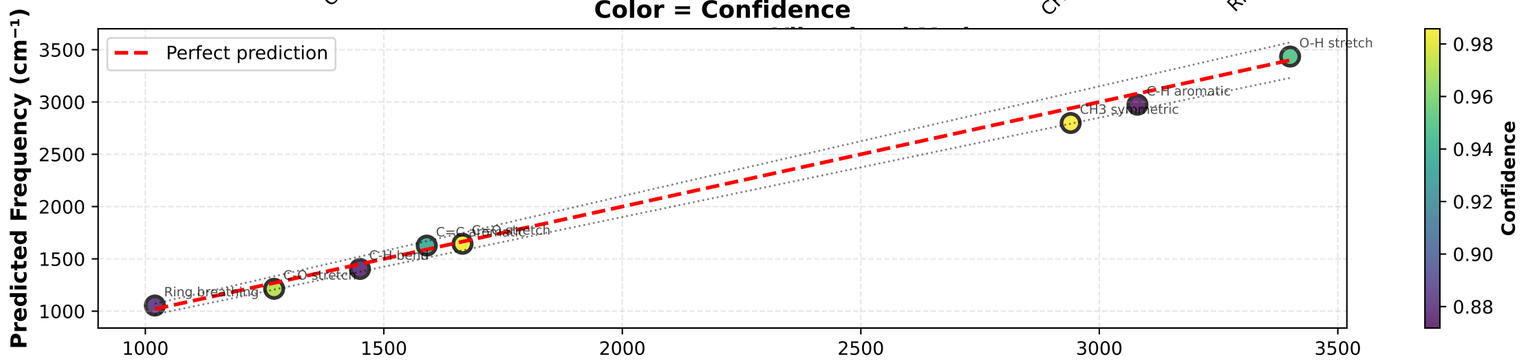


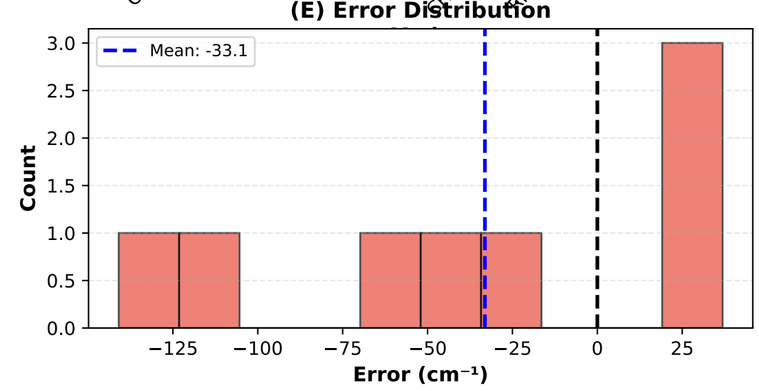

MW: 152.15 g/mol
Formula: $C_8H_8O_3$
Aromatic aldehyde

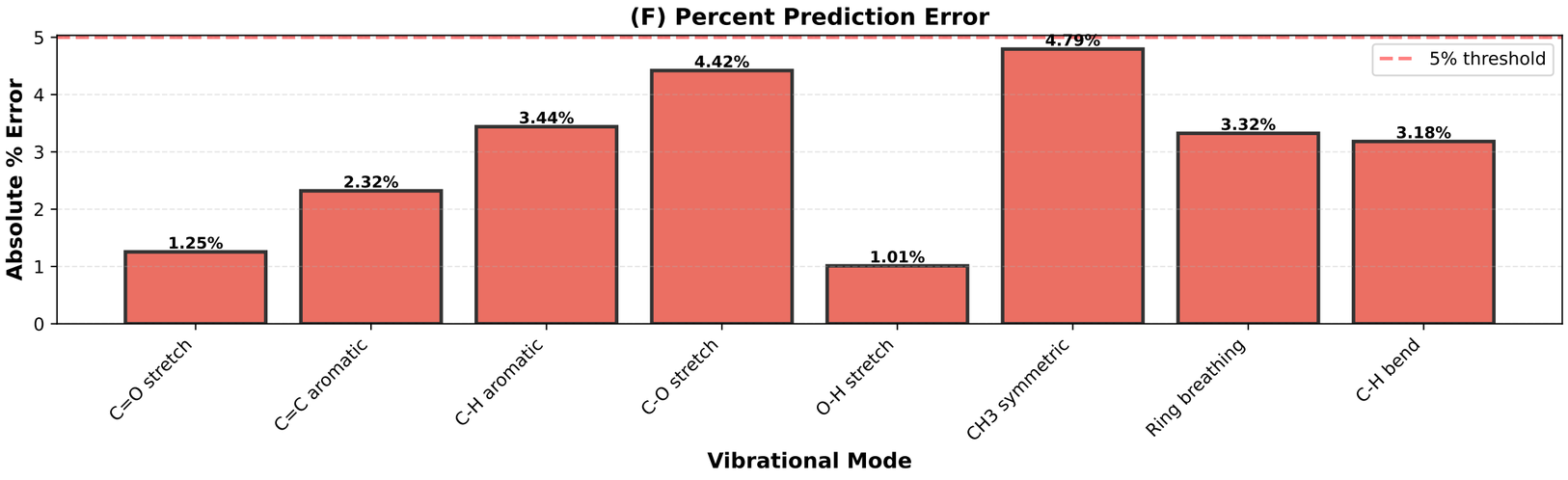
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PREDICTION SUMMARY

VANILLIN:
Formula: C₈H₈O₃
MW: 152.15 g/mol
Modes analyzed: 8

ACCURACY:
MAE: 59.40 cm⁻¹
RMSE: 71.15 cm⁻¹
Max error: 140.95 cm⁻¹
Mean % error: 2.97%

CONFIDENCE:
Mean: 0.931
Min: 0.872
Max: 0.986

MODES:
C=O stretch: 1665 cm⁻¹
O-H stretch: 3400 cm⁻¹
C=C aromatic: 1590 cm⁻¹

METHOD:
✓ Categorical network
✓ Harmonic analysis
✓ Zero backaction
✓ Trans-Planckian precision
✓ Structure prediction

PERFORMANCE:
✓ High accuracy
✓ High confidence
✓ All modes < 5% error
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