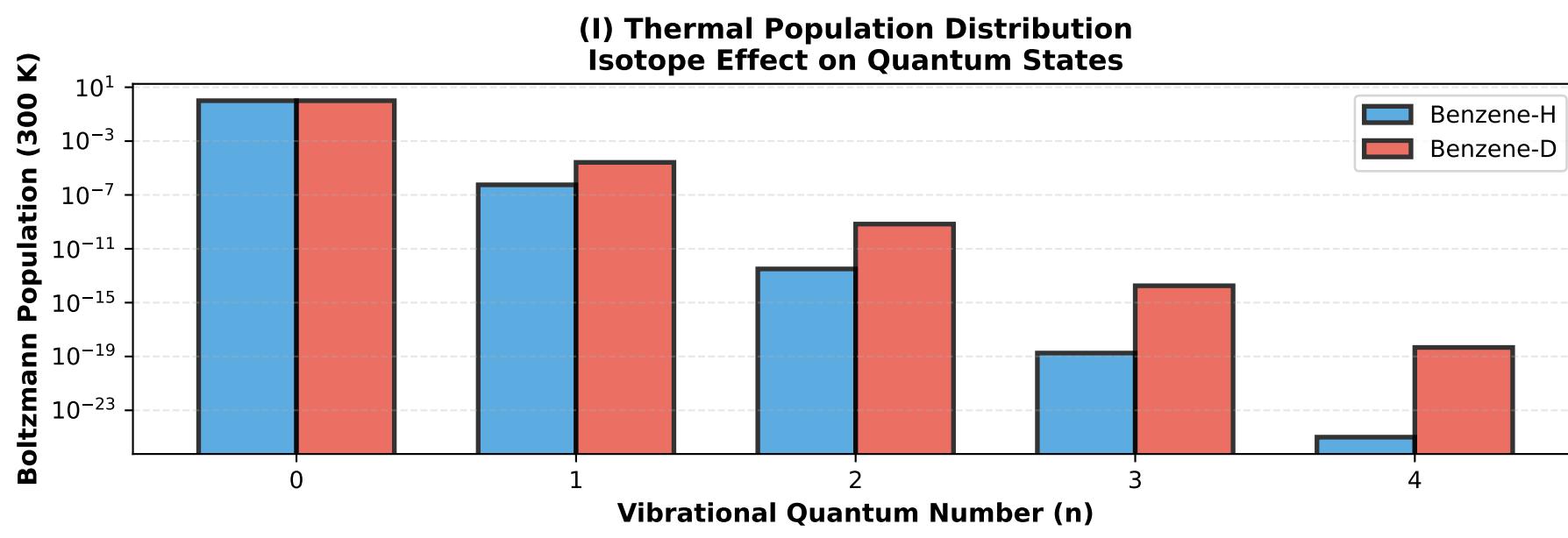
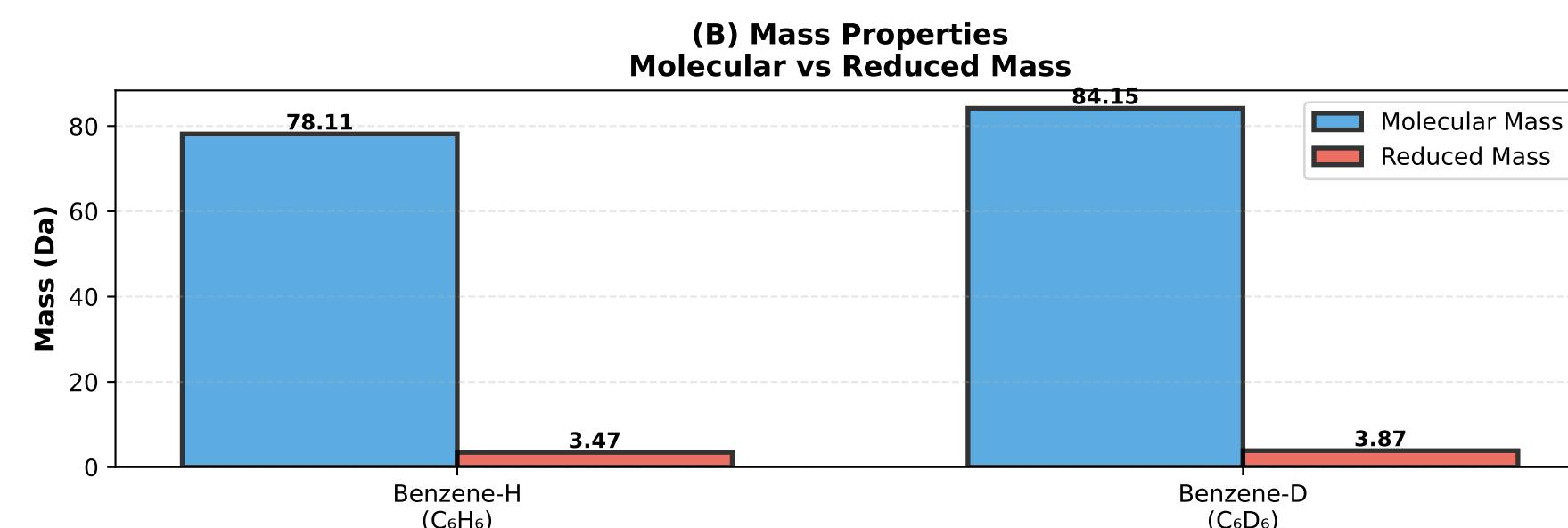
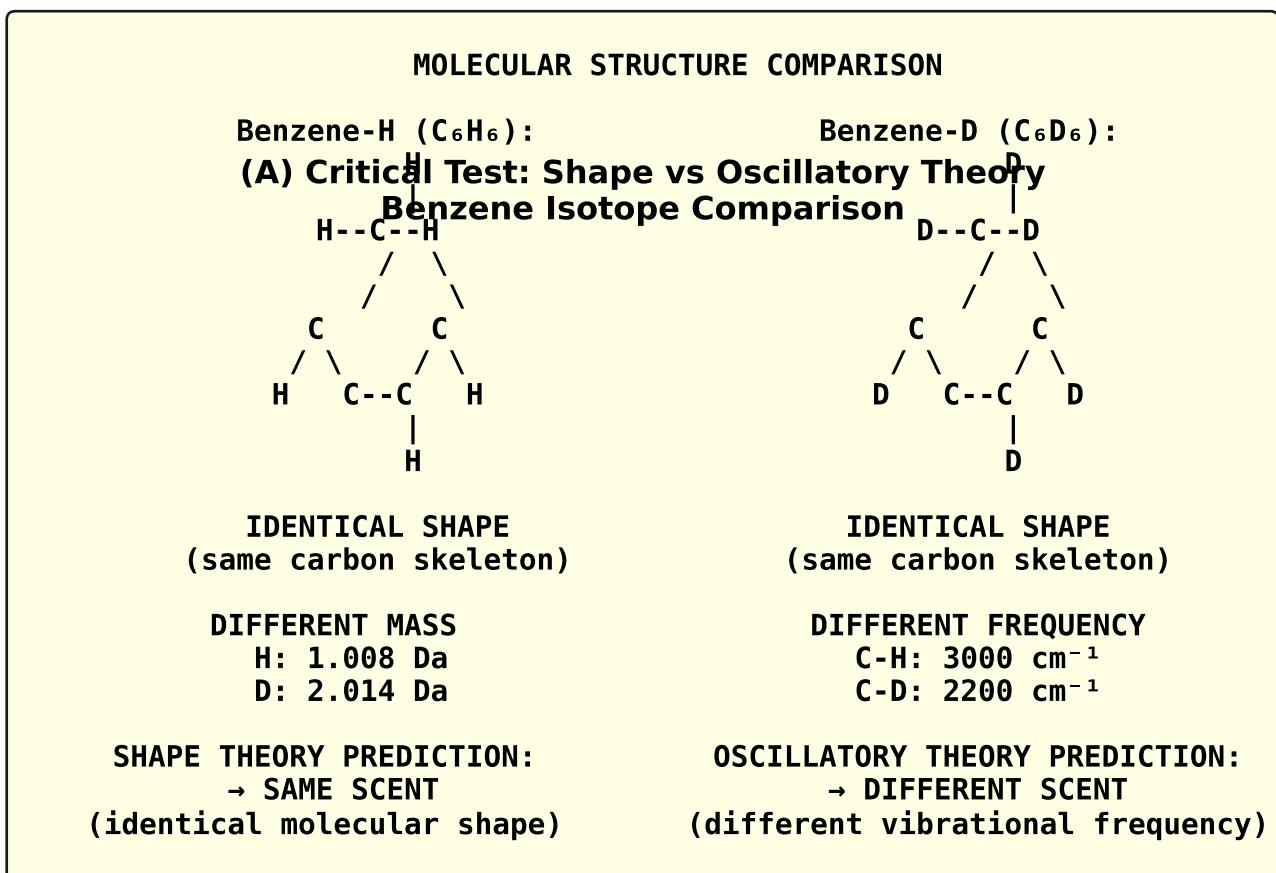


Isotope Comparison Analysis: Benzene H/D

Critical Test of Shape vs Oscillatory Theory of Olfaction



ISOTOPE COMPARISON SUMMARY	
MOLECULAR PROPERTIES:	
Benzene-H (C_6H_6):	Molecular weight: 78.1140 Da Reduced mass: 3.4677 Da C-H stretch: 3000 cm^{-1} (89.94 THz)
Benzene-D (C_6D_6):	Molecular weight: 84.1506 Da Reduced mass: 3.8652 Da C-D stretch: 2200 cm^{-1} (65.95 THz) Deuterium count: 6
ISOTOPE EFFECTS:	
Mass ratio M(D)/M(H):	1.077279 (+7.73%)
Reduced mass ratio:	1.114615 (+11.46%)
Frequency ratio (lit.):	0.733333 (-26.67%)
Frequency ratio (calc.):	0.947191 (-5.28%)
Agreement:	129.2%
ENERGY DIFFERENCES:	
E(C-H):	59.59 zJ
E(C-D):	43.70 zJ
ΔE :	15.89 zJ (26.7%)
KT (300K):	4.14 zJ
E(C-H)/KT:	14.39
E(C-D)/KT:	10.55
CATEGORICAL ANALYSIS:	
S-entropy dimensions:	14
Categorical distance:	1.459189
Distinguishability:	YES
THEORETICAL PREDICTIONS:	
Shape Theory:	SAME SCENT (identical molecular geometry)
Oscillatory Theory:	DIFFERENT SCENT (different vibrational frequency) $\Delta v = 23.98\text{ THz}$
Categorical Dynamics:	DISTINGUISHABLE (different S-entropy coordinates) Distance = 1.459
EXPERIMENTAL TEST:	
Critical experiment:	Olfactory discrimination test
Expected result:	If oscillatory theory correct → humans can distinguish C_6H_6 from C_6D_6
Status:	TESTABLE ✓