EARLY RESULTS FROM A RIGOROUS K/KA-BAND HUNT FOR AROMATIC MOLECULES (ARKHAM): UBIQUITOUS AROMATIC CARBON CHEMISTRY AT THE EARLIEST STAGES OF STAR FORMATION

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The widespread presence of aromatic molecules in (pre-)planetary nebulae and evolved stars, as evidenced by the ubiquitous Unidentified Infrared Bands, suggests that a substantial portion of this material is formed in a 'top-down' manner via the breakdown of carbon soot in circumstellar envelopes. The recent detection of benzonitrile (c-C_6H_5CN), a polar proxy for benzene (c-C_6H_6), in the prestellar molecular cloud TMC-1, however, suggests that 'bottom-up' pathways to aromatic molecule formation may also be operative. We present new radio astronomical evidence of benzonitrile in four additional pre-stellar, and possibly protostellar, sources: Serpens 1A, Serpens 1B, Serpens 2, and MC27/L1521F. These detections establish that benzonitrile is not unique to TMC-1; rather aromatic chemistry appears more widespread throughout the earliest stages of star formation than previously thought. Initial analysis reveals the benzonitrile to cyanopolyyne ratio is consistent within a single parent cloud, indicating that the initial conditions and atomic/molecular reservoirs may be important to understanding the formation for simple aromatic molecules. We will also briefly discuss the expansion of this survey to an even wider range of sources.