P123a PEACHES: Formation of CH_3CN in Class 0/I protostars

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Methyl cyanide (CH_3CN) is an important trace molecule in the ISM, especially in star-forming regions where it is commonly used as a gas thermometer to derive kinetic temperatures. Although it has been detected in a variety of objects, the formation of CH_3CN, whether from gas-phase or grain-surface reactions is still a matter of debate. For instance, CH_3CN is considered to form mainly on grain surfaces in hot cores while gas-phase reactions seem to dominate the formation of CH_3CN in starless and prestellar sources. Here, we present one of our latest results from the Perseus ALMA Chemistry Survey (PEACHES), an unbiased ALMA chemistry survey toward the embedded (Class 0/I) protostars in the Perseus molecular cloud (ASJ meeting Sep. 2018, P123b). In our sample, we find a remarkably strong correlation between CH_3CN and CH_3OH, of which its formation is well-known to be solely reliant on grain-surface reactions. Our results thereby indicate that CH_3CN and CH_3OH have similar underlying chemistry and grain-surface reactions may be important in CH_3CN formation in embedded protostars. In addition, we obtain a consistent range of CH_3CN/CH_3OH ratio to those obtained from other samples of Class 0/1 protostars across various regions. This ratio is however generally disagree with those in prestellar and protostellar sources, which may further imply that different formation routes of CH_3CN are at play between prestellar and protostellar phases.