



**Figure S2.** The growth from naphthalene to anthracene via  $\text{C}_2\text{H}_2$  addition, with barrier heights (in kcal/mol) calculated at the G3(MP2,CC)//B3LYP/6-311G\*\* level of theory by Chu et al. [3].

## References

1. Lizardo-Huerta JC, Taamalli S, Sood K, Gasnot L, Louis F, et al. 2022. Thermochemical and kinetic studies of H-abstraction reaction of benzofurans and benzodioxins by H-atoms. *Computational and Theoretical Chemistry* 1209:113589
2. Bounaceur R, Da Costa I, Fournet R, Billaud F, Battin-Leclerc F. 2005. Experimental and modeling study of the oxidation of toluene. *International Journal of Chemical Kinetics* 37:25–49
3. Chu T, Smith MC, Yang J, Liu M, Green WH. 2020. Theoretical study on the HACA chemistry of naphthalenyl radicals and acetylene: The formation of C<sub>12</sub>H<sub>8</sub>, C<sub>14</sub>H<sub>8</sub>, and C<sub>14</sub>H<sub>10</sub> species. *International Journal of Chemical Kinetics* 52:752–68
4. Therrien RJ, Ergut A, Levensis YA, Richter H, Howard JB, et al. 2010. Investigation of critical equivalence ratio and chemical speciation in flames of ethylbenzene–ethanol blends. *Combustion and Flame* 157:296–312