**LGPS solid state electrolyte and its neighboring vacancy variants in ‘ab plane’.**

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| **Initial Li atom** | **Coordinates** | **Neighboring Li** | **coordinates** |
| Li1(1) | [0.75395, 0.31751, 0.77198] | Li7(77) | [0.5, 0.33802, 0.75] |
| Li2(17) | [0.5, 0.58212, 0.25] | Li7(78) | [0.5, 0.66198 ,0.25] |
| Li3(25) | [0.34169, 0.58929, 0.71998] | Li10(102) | [0.16284 0.58972 0.61772] |
| Li4(41) | [0.49741, 0.55633, 0.95685] | Li8(86) | [0.25, 0.5, 0.93927] |
| Li5(57) | [0.0, 0.75, 0.25] | Li1(2) | [0.24605, 0.68249, 0.22802] |
| Li7(84) | [0.5, 0.83802,0.25] | Li2(23) | [0.5, 0.91788, 0.25] |
| Li9(100) | [0.25 0. 0.84271] | Li10(114) | [0.33716 0.08972 0.88228] |
| Li10(116) | [0.16284, 0.91028, 0.88228] | Li3(39) | [0.34169, 0.91071, 0.78002] |
| Li8(85) | [0.75, 0.5, 0.06073] | Li4(42) | [0.50259, 0.44367, 0.04315] |
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