various functional groups. In the absorption band 3443.63 cm^{-1} shows the absorption peak intensity is very strong and wide, it indicates the presence of O-H strain absorption. The absorption band 2938.85 cm^{-1} shows the absorption of the C-H strain. The absorption band 1751.41 cm^{-1} shows the absorption of C = O strain which is thought to originate from the carboxyl group of carboxylic acids which is supported by a very wide O-H absorption band due to hydrogen bonding with its dimer. Absorption at 1254.13 cm^{-1} shows C-O-C absorption and 1016.81 cm^{-1} represents symmetric C-O-C absorption (on glycosides bonds) [25]. This data supports that the isolated pectin has the structure shown in Figure 10.

IV. Conclusion

This research showed that the length of extraction and the interaction between pH and the length of extraction, significantly affect the pectin yield, and the interaction between pH and the duration of heating time on extraction have a significant effect on the content of pectin, and the interaction between pH and time significantly affects the methoxyl content of pectin. Overall, pH, temperature and extraction time of cocoa pod are significantly affecting the yield, pectin content and methoxyl content. The optimum conditions for extracting cocoa pod pectin with *Responses surface methodology* are pH 2, temperature 95°C and extraction time 3 hours with predicted pectin yield 2.33% pectin content 44.39% and methoxyl content 7.08%. After verification, the result is pectin yield 2.16%, pectin content 45% and methoxyl content 8.99%. The significant difference between the prediction of the program and the results of verification means that the optimal process of extracting cocoa pod pectin is acceptable. From FTIR test of pectin, it is known that the absorption band 3443.63 cm^{-1} shows a very strong and wide absorption peak intensity, the presence of O-H absorption, strain. The absorption band 2938.85 cm^{-1} shows the absorption of C-H strain. The absorption band 1751.41 cm^{-1} shows the absorption of C=O strain which is thought to originate from the carboxyl group of carboxylic acids which is supported by an extensive O-H absorption band due to the presence of hydrogenic bonds with its dimers. Absorption at 1254.13 cm^{-1} shows the absorption of C-O-C and 1016.81 cm^{-1} represents symmetric C-O-C absorption (on glycosides bonds)

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