

Fig. 7 Probability density plot of LS and ML estimates

Fig. 8 shows the morphology of the fractured surface of the porous ceramic. The morphology of the porous ceramic shows a relative distribution of slit-shaped pores which resulted in high value of the Weibull modulus. The porous ceramic shows a relative distribution of slit-shaped pores as shown by BJH analysis. It is well known that a material under load may break under a sharp crack but not break from a blunt flaw such as pore of similar size and each type of flaw has its own distribution as reported by [11]. The presence of uniformly distributed pores in the sample makes the reliability of the porous material to be very high and of predictable failure strength.

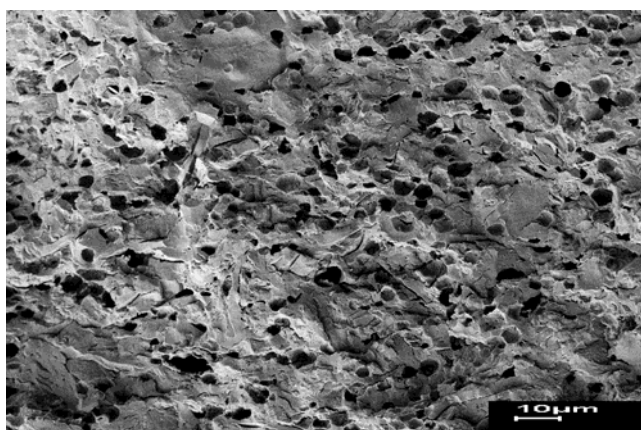


Fig. 8 Fractured surface morphology of porous sintered clay

## VI. CONCLUSION

The result of the XRD and XRF show that the clay is a good source of mullite ceramic which formed at temperature above 1100°C. The BET result shows that the porous sintered clay is mesoporous. Three-parameter Weibull can be used to model the variability and reliability of porous sintered clay. Kaplan Meier estimate give the best fit for the porous sintered clay due to the low value of Anderson-Darling statistics. Maximum likelihood estimate gives the overall best fit as compared to least square estimates. However, the Weibull modulus of the porous ceramic is relative higher, hence makes

higher chances for the prediction of probability of failure. The morphology of the fractured surface of the porous ceramic shows relatively distribution of rounded pores which result in the high value of the Weibull modulus, high reliability and highly predictable. The three parameter Weibull shows that the porous sintered clay is suitable for membrane process in micro and ultrafiltration applications. Further research should be conducted for wastewater treatment to ascertain the filtration performance of the produced porous sintered clay.

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