

Update on Foam Analysis

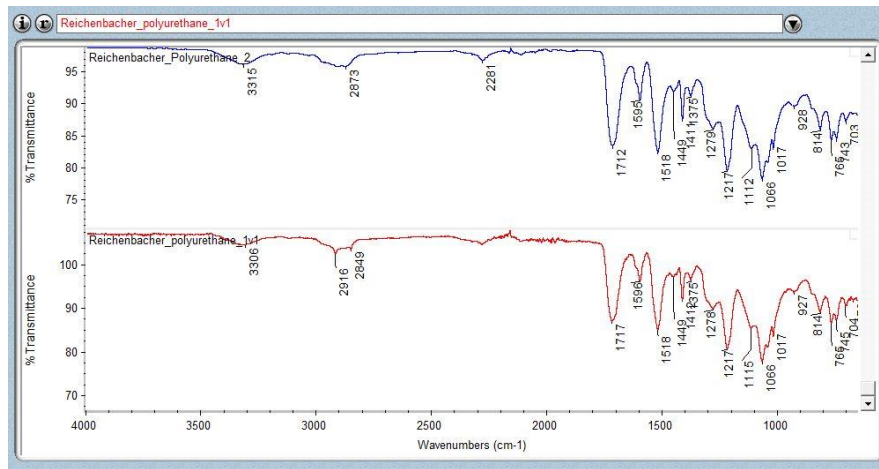
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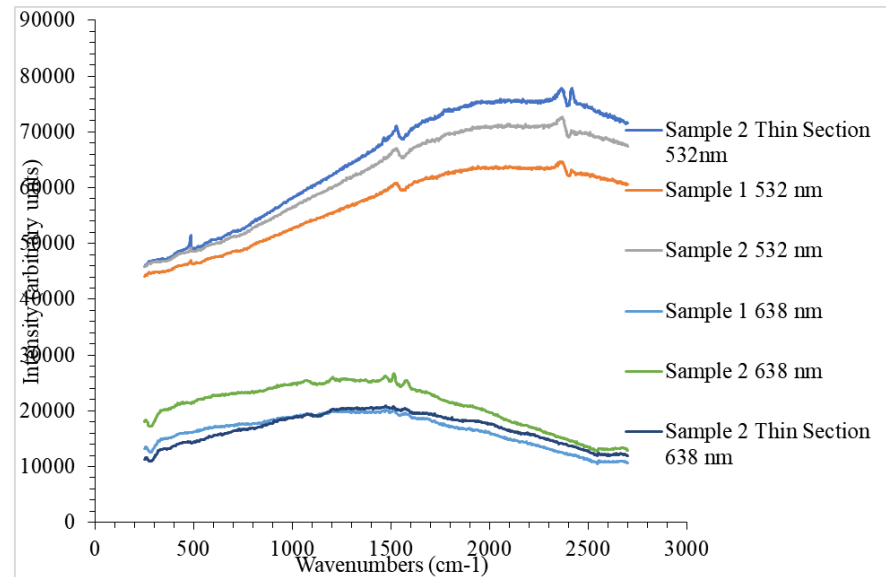


DUNE Far Detector Backgrounds Task Force Meeting
Dec 13, 2019

FT-IR



Raman



FT-IR indicates polyESTER-urethane (but one table assigns polyETHER-urethane)

Raman result hints at polyESTER-urethane, but is even less conclusive

CHN Analysis at Ulowa

<64.41> mass % C
<5.95> mass % H
<5.5> mass % N
<24.14> mass % O (100% - CHN%)

With a factor of 10 the relative quantity unit for N becomes approx. 4.

And including oxygen (accounting for the remainder), we get then a stoichiometric formula of our molecule of

C54 H60 N4 O15

or

C27 H30 N2 O7.5

or

C13.5 H15 N1 O3.75

compared to literature polyESTER urethane:

C17 H15 N2 O4

This gives us a good match for polyESTER urethane (instead of polyETHER urethane)!

And compared to our existing computer simulation (GDML material definition "Layer2Molecule"):

C17 H16 N2 O4

it is not that far off.

But it is largely different from literature polyETHER urethane R-PUF w/ HFC 245 "our best case for neutron moderation" (most H abundance):

C16 H32 N2 O4