



# Ion Beam Analysis of PISCES Graphite Tiles at the UW-Madison Accelerator/PSI Lab

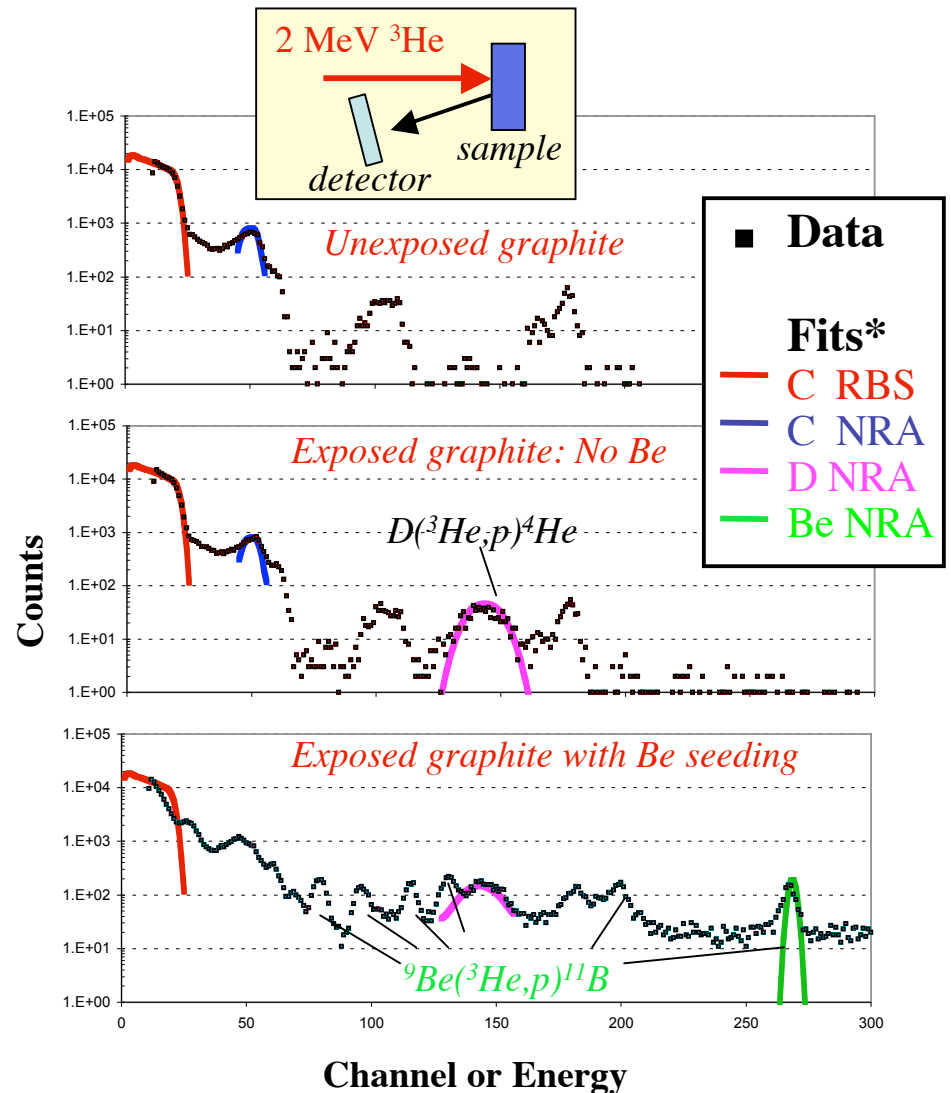
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# Nuclear Reaction Analysis of PISCES-exposed graphite samples show substantial Be and D buildup

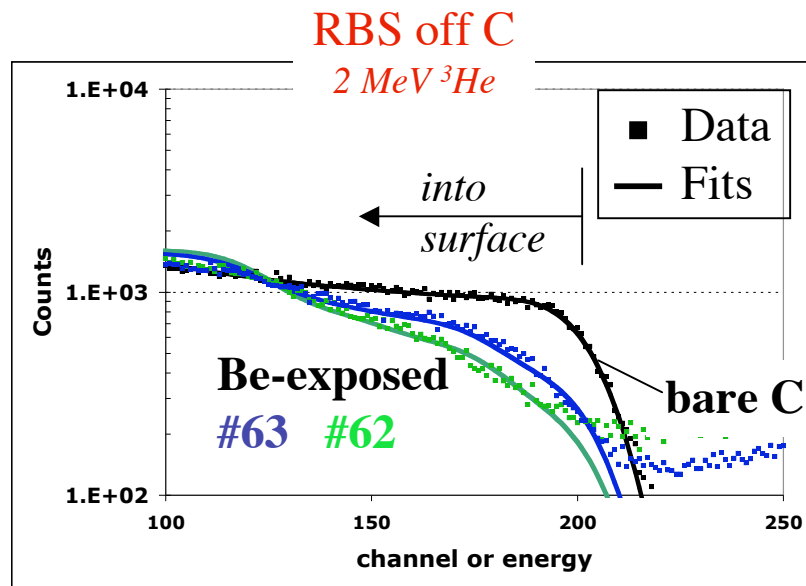
## PISCES Graphite exposures

$E_i = 50 \text{ eV}$ ,  $\Gamma_{i,D} = 1.5 \times 10^{18} \text{ cm}^{-2}$ ,  $T \sim 175 \text{ C}$

Sample	#62	#63	#64
$\Delta t_{\text{exposure}}$ (s)	1600	4800	4800
Seeded $f_{\text{Be}}$ (%)	0.15	0.15	0
<b>Delivered <math>\Phi_{\text{Be}}</math></b> ( $10^{17} \text{ cm}^{-2}$ )	<b><math>\sim 36</math></b>	<b><math>\sim 108</math></b>	<b>0</b>
<b>Sample <math>\Phi_{\text{Be}}</math></b> ( $10^{17} \text{ cm}^{-2}$ )	<b><math>\sim 30</math></b>	<b><math>\sim 35</math></b>	<b>0</b>
Sample $\Phi_{\text{Deuterium}}$ ( $10^{17} \text{ cm}^{-2}$ )	3.1	2.3	1.7
D / (Be + C) (%)	$\sim 7$	$\sim 2$	$\sim 3$

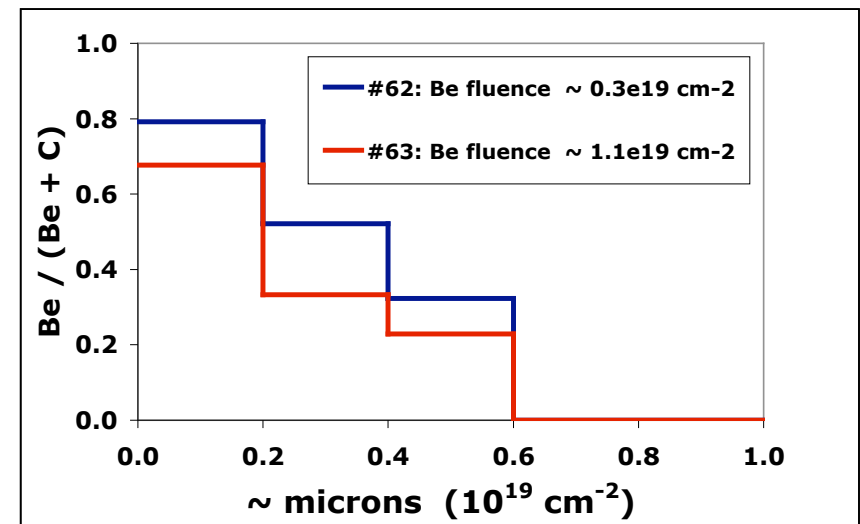


# The Be-rich layer is $\sim 0.5$ microns thick and has D retention $\sim 2-7\%$



- RBS shows that the carbon is depleted in the near surface and replaced by Be.

## Be concentration depth profiles



- Fits show that the Be enrichment is not constant, but decreases deeper into the sample.
- NRA estimates of D ratio in the layer
  - #62:  $\sim 7\%$  (D / Be + C)
  - #63:  $\sim 2-3\%$