

# **Quick Guide**

# for

# ThiMeT: Thickness Measurement Tools for SRIM

## v1.0

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#### www. ThiMeT.org

ThiMeT is a code for thickness calculation using SRIM (www.srim.org) stopping power values. ThiMeT code also can be used for the determination of the required thickness for energy degraders which are needed for nuclear reactions. ThiMeT calculation is very easy and quick compared to the TRIM code calculation. ThiMeT code also contains TTEC Module for calculation of the mean transmission energy from the TRIM output file "transmit.txt".

#### Cite:

- 1. C. Yalçın, "Thickness measurement using alpha spectroscopy and SRIM", Journal of Physics: Conference Series, 2014.
- 2. The Thickness Measurement Tools for SRIM (ThiMeT), www.thimet.org

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### Installation of ThiMeT

Because of the ThiMeT code uses SRIM code, first you should install it. SRIM code can be download from <u>www.srim.org</u>.

After the installation of the SRIM, download the ThiMeT code (www.thimet.org) for appropriate platform which you use. Extract the zip file and copy the ThiMeT code folder wherever you want. This folder includes **"Docs"**, **"OUT\_ThiMeT"** and **"OUT\_TTEC"** sub-folders and also **"ThiMeT.exe"**, **"TTEC.exe"** and **"SRIM\_Path.txt"** files. Open the **"SRIM\_Path.txt"** file and change your own path of the SRIM code and save it. Now you ready to use ThiMeT code.

### **Running ThiMeT Code**

Because of the ThiMeT code uses SRIM parameters, first you should adjust SRIM code for calculation. Follow these steps;

1. Run the SRIM code and chose the "Stopping / Range Tables",



2. Chose projectile from "ion" section,



3. Add the material which is correspond your target or degrader from **"Add element"** or **"Compound Dictionary"**,



4. Change the **"Stopping Power Unit"** to <u>**"keV / micron"**</u>.



5. If **"Density"** and **"Compound Correction"** are correct, and there is no need to change them, then click to **"Calculate Table"**,

🔫 Ion Stopping 8	Range Tables				
Ion Sto	oppina	and R	ange Tal	bles	
Ion   Targe	Symbol Name T He Helium Target Desc Helium in	Atomic Number 2 ription Aluminum	Mass Ion Energy R (amu) Lowest H 4.003 10 Den: (g/cr 02.702	ange (keV) lighest 10000 sity Gas n3) Tgt. 200	
Add Element	Compo	und Dictionary	Restore Last	Target	
Delete Element Symbol	Name	Atomic Number We	ight (amu) Stoich A	tom	
	iminum 💌	<u>113</u> 26	.982  1  1		
Stopping Power Uni	ts		Calculate	Table	
keV / micron Clear A					
Compound Correcti	on		Main Menu	Quit	
			Problem S	olving	

6. Click to "OK", then click to "Close" to close calculated results,

SR Calculation: SRIM Outputs\Helium in Aluminum.txt	
SRIM version> SRIM-2013.00 Calc. date> October 23, 2014	
Ion = Helium [2] Mass = 4 003 amu	×
Target Density = 2.7020E+00 g/cm3 = 6.0305E+2:     The Output will be displayed in a window, and also stored as a diskfile in the SRIM directory.       Atom Atom Atomic Mass     Mame Numb Percent Percent       Al 13 100.00 100.00     Enter a FILENAME for the output diskfile.	OK Cancel
Bragg Correction = 0.00% Stopping Units = keV / micron See bottom of Table for other Stopping units Ion dE/dx dE/dx Projected Longitudinal Lateral Energy Elec. Nuclear Range Straggling Straggling	
10.00 keV     6.908E+01     1.169E+01     882 A     485 A     406 A       11.00 keV     7.297E+01     1.118E+01     964 A     513 A     433 A       12.00 keV     7.669E+01     1.072E+01     1045 A     538 A     459 A       13.00 keV     8.029E+01     1.030E+01     1124 A     562 A     483 A       14.00 keV     8.376E+01     9.923E+00     1202 A     584 A     506 A       15.00 keV     8.711E+01     9.574E+00     1279 A     605 A     528 A       16.00 keV     9.037E+01     9.253E+00     1354 A     624 A     549 A       17.00 keV     9.353E+01     8.956E+00     1428 A     643 A     570 A       18.00 keV     9.661E+01     8.681E+00     1502 A     660 A     589 A       20.00 keV     1.025E+02     8.186E+00     1645 A     693 A     696 A       Close	

7. Close the SRIM.

Now you are ready to use ThiMeT. For the same material and ion you don't need to do same steps given above but if you want to calculate for new material or for new projectile, you should follow again steps 1 to 7.

In order to run ThiMeT code just double clicks to **"ThiMeT.exe"** file or in command mode type **"ThiMeT.exe"**. Code will ask you just two parameter, **"Projectile energy"** and **"Exit energy"** from the material. Please give energies as **integer** and in <u>"keV"</u> unit. Code will calculate thickness in a few seconds, according to energy difference between incident ions and exit ions may be it takes longer. Thickness results are in two units; **µm** (micron) and **µg/cm<sup>2</sup>** or **mm** and **mg/cm<sup>2</sup>** according to its value.

TC:\Thimet_v1.0\ThiMeT.exe	IX
Thickness Measurement Tool for SRIM (ThiMeT v1.0)	
<01.09.2014>	
www.ThiMeT.org	
***************************************	
Projectile Energy (keV): 5486 Exit Energy (keV) : 2486 Percent Complete : 100.% ***********************************	
Calculated for ==> Helium in Aluminum	
Thickness : 16.055 micron Thickness : 4338.16 microgram ∕ cm2	
**************************************	
PAUSE To resume execution, type go. Other input will terminate the job.	
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### Contact

For the suggestions, comments and questions please send an email to <u>info@thimet.org</u> or <u>support@thimet.org</u>.