Overview

Currently Visual Basic (VBA) macros written in Microsoft Excel 2010 cannot directly use .NET class libraries such as the *stoichiometry.dll* assembly from the first project. However, a class in an assembly can be made to appear as a COM server (unmanaged library) by generating a COM Callable Wrapper (CCW) for the assembly. Excel and other unmanaged clients can use a class library assembly via such a wrapper.

The following instructions explain how to create a CCW for your *stoichiometry* assembly and then to properly configure the assembly, the CCW and the provided Excel client.

ALERT: You may have to open Visual Studio in Administrator mode to get the following instructions to work. You can do this by right-clicking on your Visual Studio shortcut and selecting *Run as administrator* from the menu.

Step 1 – Sign Your Stoichiometry Assembly

To sign the Stoichiometry assembly:

1. Open the Stoichiometry project in Visual Studio.
2. Add a reference to the key file in the project's *properties.*
    a. Right-click on the project in the Solution Explorer and select *Properties*
    b. Select the *Signing* page
    c. Click on *Sign the Assembly*
    d. Select *<Browse…>* under *Choose a Strong Name Key File*, or if you haven't already created a key file select *<New…>* to create one.
    e. Type in a password if you choose to password-protect your key file.

Step 2 – Generate and register your CCW

You can have Visual Studio automatically generate your COM Callable Wrapper (CCW) and register it when you build your *Stoichiometry* assembly as follows:

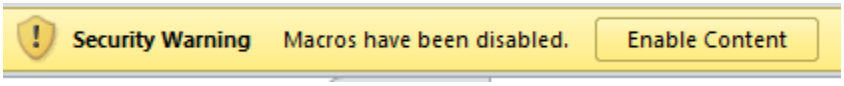
1. Open the *Stoichiometry* project in Visual Studio.
2. In the Property pages for the *Stoichiometry* assembly:
    a. select the *Application* page, click on *Assembly Information* and click on *Make assembly COM-Visible*
    b. select the *Build* page and click on *Register for COM interop*
3. Rebuild the Stoichiometry assembly – this will generate and register the CCW (*stoichiometry.tlb*). Do not move this file! Visual Studio makes an entry into the System Registry in Windows which incorporates the path to the file.

Step 3 – Make the Excel client reference <u>your</u> Stoichiometry assembly

<u>Note</u>: Before opening the client document in Excel the *Stoichiometry.mdb* database must installed be in the working directory for Excel (probably 'Documents') unless your Stoichiometry.dll expects the database to be in a specific location.

Using Microsoft Excel:

1. Open the client document *INFO-5060.P1.Client.xlsm*
2. If you don't see a menu tab called *Developer*, click on *File* in the menu ribbon then select *Options*. On the *Custom Ribbon* page check *Developer* on the right side and click *OK.*
3. On the Developer menu, click on the *Visual Basic* tool.
4. In the Visual Basic Editor, select *Tools->References…*
5. In the *References – VBAProject* dialog find and checkmark *Stoichiometry* in the *Available References* list and click *OK*.
6. Close the Visual Basic Editor window.
7. Above the formula bar you should see a line that says *Security Warning* as follows:



   Click the *Enable Content* button to the right of this.
8. If everything is working correctly the *Weight* and *Normalized Formula* columns on the *Your Calculator* page should show valid results. See the *Expected Results* tab to see what output should be produced.