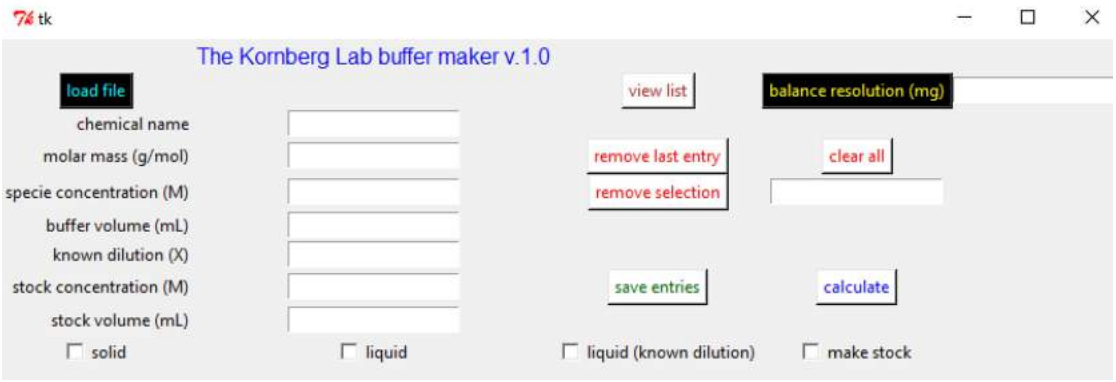
Buffer Maker

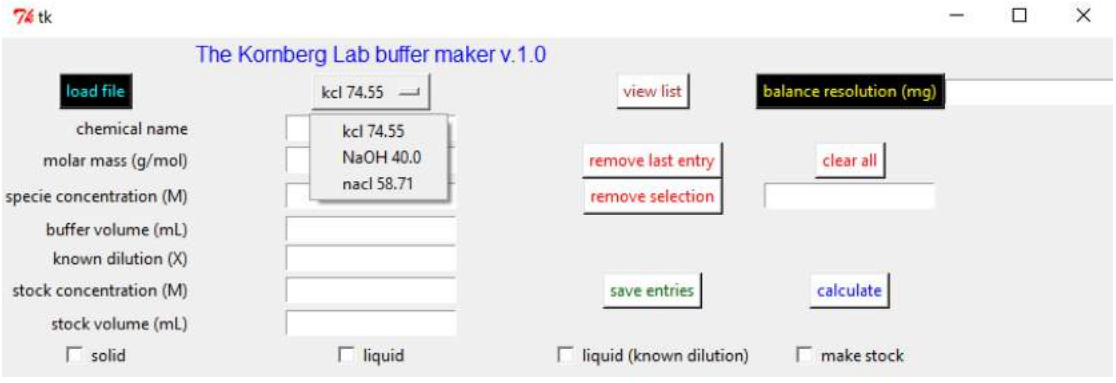
The program above is a GUI application that can be used to input different chemicals and their properties, and generate an output for the exact amount of compounds that need to be added to prepare the desired buffer-.The program can help the user to make a buffer fast, especially if the number of compounds is large.

Out[8]=



For addition of solids a file may be uploaded containing the names and the respective molar masses of the chemicals (See the format of the txt file in the email attached). Upon uploading the file, a dropdown menu will appear (image shown below).The user can then choose the desired compound. Multiple compounds can be saved in a txt file, which makes the calculation much faster without the need to google everytime.

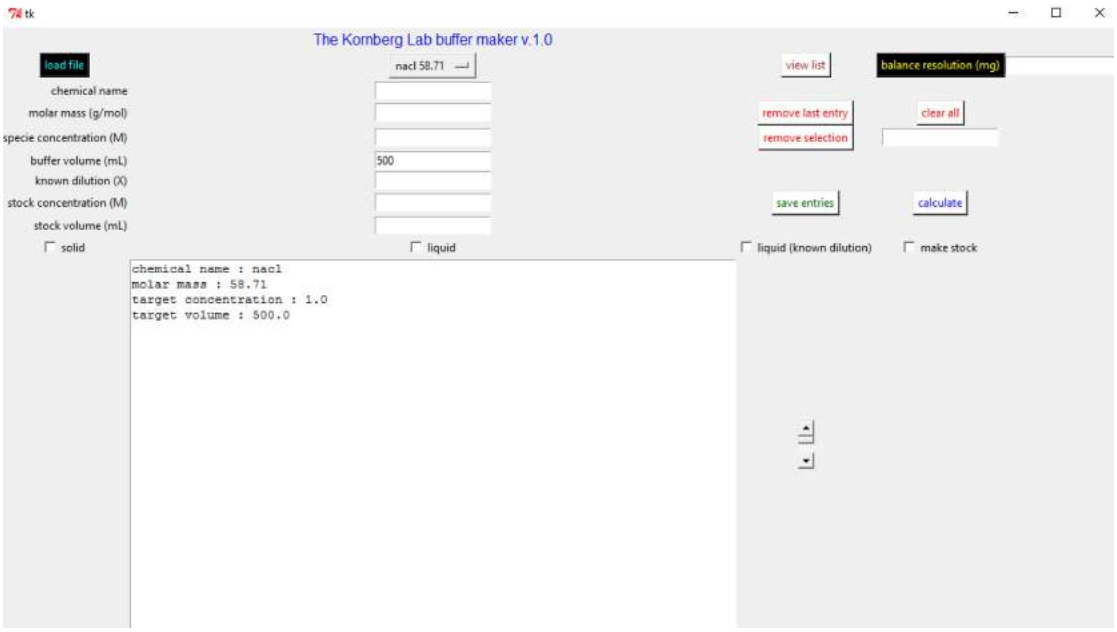
Out[10]=



The user can type in the name of the chemical and give values for the various parameters (or select from the uploaded file); once all values have been provided for a particular chemical, press save entries button to store the chemical in the list. The process can be repeated to add as many com-

pounds as required.

Out[11]=



After all the chemicals have been added, press calculate to display the results

Out[2]=

The user can enable checkboxes to disable some of the fields that are not relevant (fields will be grayed out, uncheck to enable fields).This feature is optional. Additionally the user can clear all entries in the list, remove last entry or any entry at a selected location from the list of chemicals by typ-

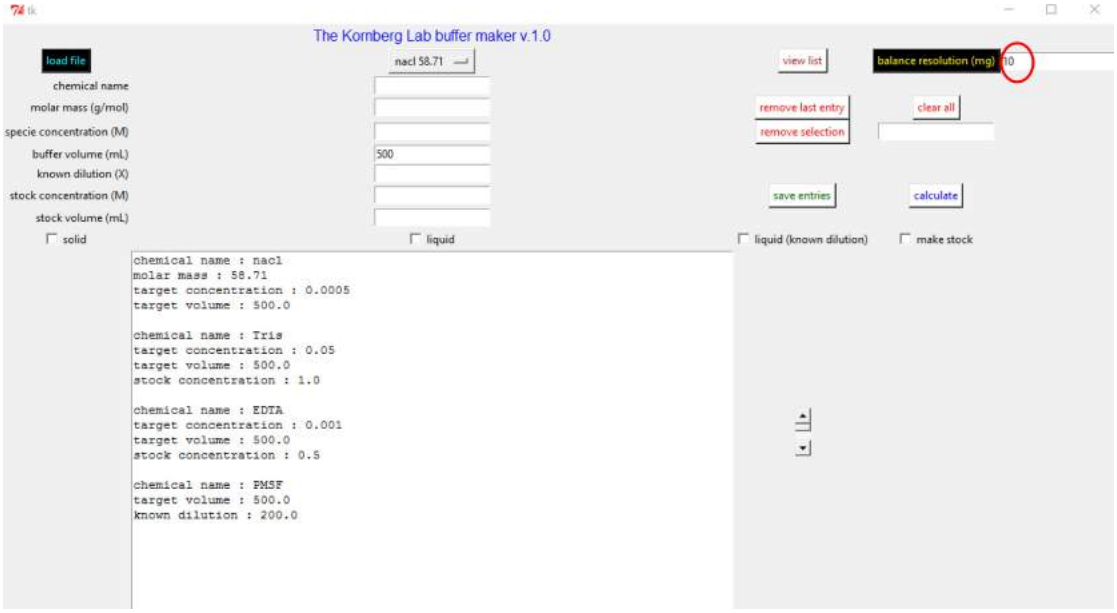
ing its position in the list (view list button can be used to determine the order in the list).This option allows the user to make edits if a mistake is made while entering values

A balance resolution field and button can be used to specify the smallest value that the pan balance can measure; if the mass of the powder/solid needed to make the buffer is smaller than the resolution, the program will notify the user to make a stock solution first (in which case, the user can enter data to make stock, save that entry and press calculate to determine the volume of liquid stock solution to be added to make the buffer).The example below shows how this functionality works

EXAMPLE

1. Consider that we wish to theoretically make 500 mL of a buffer with 50 mM Tris, 0.5 mM NaCl, 1 mM EDTA and 200x PMSF. After entering the chemical and the following information with the balance resolution defined as 10 mg (enter 10 and press balance resolution button), the program will show that you need to add 14.68 mg of NaCl

Out[3]=



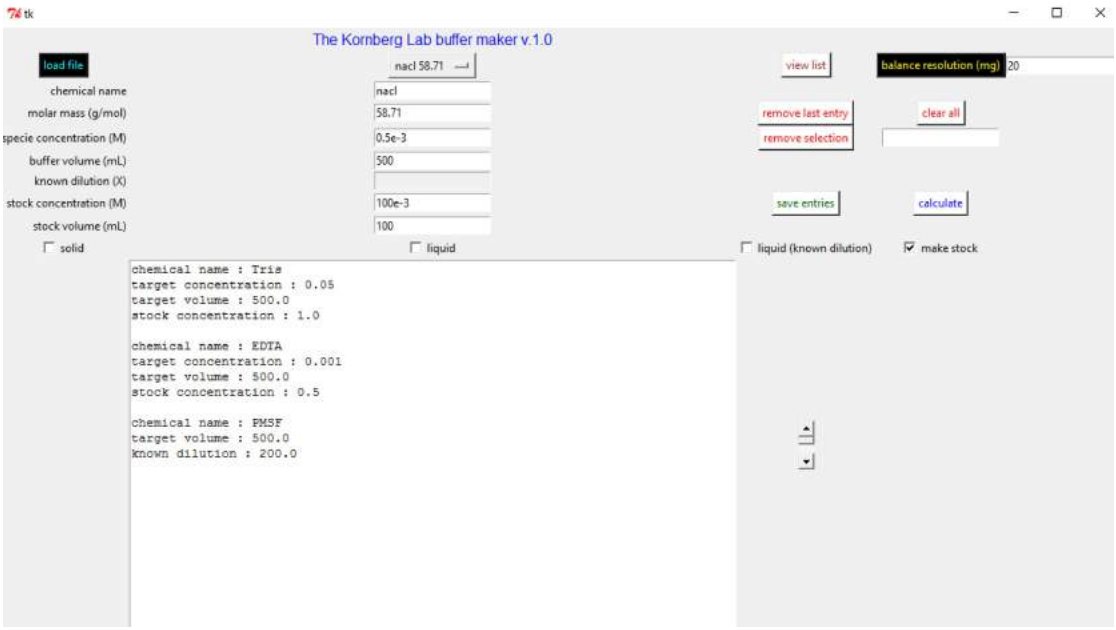
Out[4]=

2. If we change the resolution to 20 mg and then press calculate, the program will display a message that its difficult to measure, and to make a stock solution for NaCl.

Out[5]=

In the case above, the list will not store the values of NaCl (pressing view list will show all entries except NaCl). Prepare the stock solution for NaCl (100 mM, 100 mL) by entering values in the fields as shown below :

Out[7]=



Pressing save entries and calculate will yield that the user needs to add 2.5 mL from a stock solution of 100 mM NaCl

Out[6]=