



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Simon He	Project Number S0505
Project Title Synthesis of Boronic Acids	
Objectives/Goals To synthesize 2-methylpyridine-5-boronic acid and 3-fluoropyridine-5-boronic acid from 5-bromo-2-methylpyridine and 3-bromo-5-fluoropyridine respectively.	
Abstract Methods/Materials In this experiment, two boronic acid compounds were synthesized from pyridine bases and triisopropyl borate. This was done by first dissolving the chosen pyridine reactants and dissolving them into solution in tetrahydrofuran. Then, the triisopropyl borate was added to the solution to prepare for the further reaction. Afterwards, butyllithium was added into the solution, the resulting reaction of butyllithium and the pyridine starting compounds would form a pyridine complex that would not need as much energy to react with the triisopropyl borate as the 5-bromo-2-methylpyridine or the 3-bromo-5-fluoropyridine substances would. The intermediate generated by the lithium + ?-pyridine molecule would readily react with with the triisopropyl borate (boric acid) to generate the desired products. which are 2-methylpyridine-5-boronic acid and 3-fluoropyridine-5-boronic acid after decomposing in water	
Results The desired products, which are 2-methylpyridine-5-boronic acid and 3-fluoropyridine-5-boronic acid were successfully synthesized. These products were found in high purities (~99%) and in generally large yields (above 80%).	
Summary Statement The synthesis of two boronic acids in high yield.	
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