

# Benzodiazepine Detection in Alcoholic Beverages

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Benzodiazepines are depressants that produce sedation, hypnosis and relaxation, reducing anxiety, muscle spasms and seizures. Such drugs are available with prescription. Benzodiazepines slow down the central nervous system and, when combined with alcohol or administered at high doses, they impair victim's state of consciousness. Benzodiazepines are often administered in drug-facilitated crimes. In São Paulo, the most populous city in Brazil, four drug-facilitated crimes are reported per week. The aim of my project was to develop a mechanism of visual identification to colorimetrically detect benzodiazepine drugs in alcoholic beverages. So, I diluted three benzodiazepine drugs (alprazolam, clonazepam and diazepam) in distilled water, liqueur, vodka and whiskey. I added a selected chemical reagent in different concentrations to the solutions to obtain a colorimetric reaction. Control tests were performed using each of the respective pure alcoholic beverages and the beverages with chemical reagent. From this, I developed a detection prototype. It was possible to detect the presence of drugs in alcoholic beverages through the analysis of a selected chemical agent after addition of different concentrations of benzodiazepines to the listed liquids. Tests showed that it was clearly possible to identify a color change in an aliquot of 500  $\mu$ L alcoholic beverages containing 20mg of the chemical reagent. The colorimetric change is instantaneous, clear and can be observed with the naked eye. The prototype developed is of practical use and costs around U\$0,53. My research has reached its goal of developing a mechanism to colorimetrically detect benzodiazepine drugs in alcoholic beverages. A detection prototype is a useful tool to decrease cases of abuse and violence.

## Awards Won:

American Chemical Society: Second Award of \$3,000

Third Award of \$1,000

American Statistical Association: Certificate of Honorable Mention