Name: _____

Organic Functional Group Sudoku Puzzle

adapted from

Crute, Thomas D.; Myers, Stephanie A., *J. Chem. Educ.* 2007, **84**, 612

The precursor of the sudoku puzzle was first published in the United States in 1979 by Howard Garns, a retired architect and freelance puzzle constructor. In April 1984, the puzzle was introduced in Japan and the name "sudoku" was assigned to the puzzle. "Suuji wa dokushin ni kagiru" may be translated as "the numbers must be single" or "the numbers must occur only once". Later the name was abbreviated to sudoku (pronounced SUE-dough-coo; "su" means number, "doku" means single). In April 2005, The *New York Post* published sudoko puzzles as a regular feature and by July 2005, the puzzle surged in popularity all over the country *(1, 2)*.

The following Sudoku puzzle deals with the names and generic structures of organic functional groups found in organic molecules.They do not deal directly with numbers as a traditional Sudoku puzzle, but instead of numbers there are 9 different functional groups that replace them. The puzzle is to be solved so that there are nine different functions in each horizontal column, each vertical column, each of the nine square matrices, but not in the two diagonal columns.

The puzzle uses only generic formulas (structures) that represent the nine possible functions.

Complete the puzzle using either the functional group structure or its respective name in the empty squares. Consider the following reference:

Puzzle Reference:

alcohol	*aldehyde*	*alkyl halide*	*amide*	*amine*	*ester*	*ether*	*carboxylic acid*	*ketone*
R-OH	R-CHO	R-Cl	$R\text{-}CONH_2$	$R\text{-}NH_2$	R-COO-R'	R-O-R'	R-COOH	R-CO-R'

Compare the puzzle reference above to the course handout of functional group names & structures. There are subtle differences in the way that the functional groups can be written, which represent the same function.

http://chemconnections.org/general/chem108/Organic%20Functions-Amino%20Acids%20Names.2018.pdf

	R-COOH					$R\text{-}CONH_2$	$R\text{-}NH_2$	R-CO-R′
$R\text{-}NH_2$	R-Cl	R-CO-R′	R-OH			R-O-R′		
R-O-R′					R-COO-R′		R-Cl	R-OH
R-CO-R′								
R-COO-R′	R-OH		R-O-R′	$R\text{-}NH_2$	R-CO-R′		R-COOH	$R\text{-}CONH_2$
								R-O-R′
$R\text{-}CONH_2$	R-CO-R′		R-COOH					R-Cl
		$R\text{-}NH_2$			R-Cl	R-OH	$R\text{-}CONH_2$	R-COO-R′
R-Cl	R-COO-R′	R-CHO					R-O-R′	