A Novel Modification on Medical Face Mask To Filter Carbon Monoxide for Secondhand Smokers

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Secondhand smokers (SHS) experience severe cardiovascular diseases and respiratory disorders that often increase their death rates to about 1.2 million premature deaths annually due to inhalation of cigarette smoke components specifically carbon monoxide (CO). WHO stated that “Almost half of children regularly breathe air polluted by tobacco smoke in public places, and 65000 die each year from illnesses attributable to second-hand smoke”. Extensive search has been done on cigarette-filter components to study its ability in filtering carbon monoxide and how can the cellulose acetate be used to make a filter that filters carbon monoxide emitted from the cigarette smoke, and this filter would be added as a modification on the medical face masks to ensure its easy usage. The permeability of carbon monoxide level through the cellulose acetate membrane filtering layer could be tested using CO sensor. Evaluation of the best position of the filtering membrane inside the mask has been studied, and the number of layers has been further addressed. The results showed decrease in the level of permeated CO through the modified medical mask from original amount of 200 ppm to 70 ppm. These data revealed that the best filtration occurred using two layers of the filter while placing them in the middle of the medical mask layers. In conclusion, the mask would be a practical and affordable solution that serves as a contribution in SDG 3 (Good health and well-being) by helping secondhand smokers especially children, pregnant women and asthmatic people.

Awards Won:
University of Arizona: Renewal Tuition Scholarship