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Study on the influence of velocity, turbulence intensity and temperature on ammonia emission rate in livestock building

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Odor emissions from manure in livestock buildings are an important issue which concerns human beings healthy as well as animals. Ammonia is one of the most important odors in pig houses. The objective of this paper is to investigate the influence of local velocity, turbulence intensity and temperature on the ammonia emission rate. The experiments are conducted in a wind tunnel which is used to simulate part space of the slurry. The results show that the emission rate of ammonia increases with increasing the velocity and turbulence intensity as expected. The results also show that decreasing the temperature of ammonia aqueous solution decreases the ammonia emission rate dramatically, but the emission rate is more sensitive to the change of temperature at higher compared to lower temperature range. The mass transfer coefficient is power decayed with the local Reynolds number and Ar.

Key word: ammonia emission rate, velocity, turbulence intensity, temperature, livestock building