

persion state of the fillers in the vulcanized rubber, were obtained. The dispersion of the various fillers in the rubber were quite good. It was made clear that the filler in the rubber was found to be dispersed as the primary particle, while usually the filler itself was often observed as the aggregates and clusters. Especially it was remarkable that the dispersion state of the ultra-fine powder of 400Å dia. in rubber was first clearly caught in a photograph.

Studies on the relationship between the dispersion state of filler and the properties of rubber are now being carried on in the expectation that some results might contribute to the theory of the filler in rubber.

16. The Measurment of Specific Surface Area of Powders by Permeability Method

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The fundamental conditions on the permeability methods were investigated. The Blaine's method and the Lea and Nurse method were used, and the calcium carbonates having different sizes and shepes were mainly used for samples.

Concerning the packing of the sample bed, it was confirmed that the specific surface area decreased linearly with the increase in the porosity function (ϵ) of the same sample. The specific areas showed satisfactory agreement with the values by other methods at the minimum porosity function (ϵ_m). The influence of length and cross-sectional area of the sample bed on the measuring results were investigated and then their limits were found.

The results thus obtained are given in the following table.

Sample	ϵ_m	Average dia. (μ)					
		Permeability		Adsorption	Microscope	Sedimentation	
		Blaine	Lea-Nurse				
CaCO ₃ C	0.675	0.7	0.3	0.04	0.04*	—	
" 1	0.797	1.6	1.6	1.8	1.8	1.7	
" 6	0.703	2.0	1.8	1.8	2.0	2.5	
" U	0.573	3.4	3.4	—	3.5	3.5	
" 9	0.616	4.5	2.4	3.2	4.0	4.0	
" H	0.472	12.0	7	—	11.0	11.0	
ZnO	0.729	—	0.355	0.04	0.8	0.6	
Cement 1	0.381	7.9	10.0	—	—	9.9	
" 2	0.488	4.7	5.0	—	—	9.0	
Poly vinyl 1	0.750	—	2.9	—	5.0	—	
chloride 2	0.672	—	4.3	—	4.0	—	

* Electron microscope.