and lower frequencies. The recorded minimum at 630 cycles is for a material called "colloidal talc" or "white bentonite." It is mainly magnesium silicate with very low iron content. Similar effects are shown by the ordinary yellow bentonite which is mainly aluminum silicate.

It was also found that on d.c. and at frequencies below the minimum the sol showed negative double refraction, and at frequencies above the minimum the double refraction was positive. Vanadium pentoxide sol was similarly examined and found to have a flat frequency characteristic with positive double refraction as does nitrobenzene. The position of the minimum and details of the bentonite curves were found to depend on the age and other characteristics of the particular sol. Double refraction was determined by a double quartz wedge.[3]

This effect is similar to the anomalous change in the Kerr effect found by Kitchin and Mueller[4] with rosin, and Raman and Sirkar[5] with octyl alcohol.

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Raman Effect in Difluorochloromethane

We have observed thirteen Raman shifts in difluorochloromethane. The results are shown in Table I. The equipment used was described earlier.[1]

Three exposures were made by using Eastman Spectroscopic Plates Type 1J. Exposure times employed were 10.3, 27 and 36 hours.

Since difluorochloromethane boils at −40.8°C, a modification of our low temperature apparatus[2] was used to maintain the substance in the liquid state. The average temperature employed during these runs was −55°C.

The difluorochloromethane was furnished by the E. I. duPont de Nemours Company and was specified "Plant Product, refrigerator grade, probably 99 percent pure or better." About 50 grams of sample were available. The sample was supplied in a steel tank; connection to the cooling system was made by a Pyrex seal to a specially prepared copper fitting. Thus all connections were metal or glass, no pressure tubing, which might contaminate the sample, was used for joints. The sample was perfectly dust-free and gave spectrograms entirely devoid of background.

TABLE I. *The Raman shifts of difluorochloromethane.* $a=4358.34$A; $b=4046.56$A; $c=4077.8$A.

Raman Shift in cm^{-1}	Percent mean deviation	Exciting lines	Number of readings	Average relative intensity
3032.2	0.04	*a*, *b*	6	8 (*b*)
1353.6	0.22	*a*, *b*	4	3
1310.5	0.14	*a*, *b*	6	4
1127.9	0.24	*a*, *b*	3	0.5
1085.3	0.20	*a*, *b*	4	0.5
830.9	0.18	*a*, *b*	4	3
799.6	0.14	*a*, *b*, *c*	7	9 (*b*)
596.5	0.18	*a*, *b*	6	8
456.4	0.01	*a*	2	1
436.3	0.00	*a*	2	0.5
415.9	0.22	*a*, *b*, *c*	7	10 (*b*)
409.1	0.15	*a*	3	1
369.2	0.10	*a*	3	7

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Constancy of K^{40}

W. R. Smythe[1] has recently concluded that KCl prepared from old and deeply covered granite has essentially the same beta-ray activity as ordinary potassium salts. While this result alone appears to preclude the possibility of formation of K^{40} by present day processes associated with cosmic rays, it seems advisable to mention several experiments performed in this laboratory to test this very point.

A mass-spectrographic investigation of the relative abundance of K^{40} in comparatively fresh Vesuvius lava and in various clay soils failed to detect any measurable difference in the abundance ratio. In making these tests the samples were not subjected to any chemical treatment. In a further set of experiments the beta-rays of pure KCl extracted from Saratoga Spring water were contrasted with beta-rays of potassium from various commercial sources. The Saratoga Springs KCl was prepared by Dr. Oskar Baudisch who used the perchlorate method. The beta-ray measuring technique was the same as that described previously.[2] No detectable difference was observed between the various samples. These results are of interest since the best available geological information[3] indicates that Saratoga Spring waters derive their mineral content from deeply covered Pre-Cambrian formations. If the radioactivity is enhanced by any processes continually going on at the surface a change in the beta-ray emissivity should have been detected.

While these results are purely negative, they indicate, in agreement with those of Smythe, that the K^{39}/K^{40} abundance ratio is comparatively constant throughout nature. It seems justifiable, therefore, to use the $K^{40}-Ca^{40}$ ratio in estimating the age of matter.[4]

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