about 6000 barns in agreement with the value obtained above. The measured fissionability was corrected for the Am^{241} present ($\sigma_{fission}$ 3.0 barns).[1,5] The fact that the Am^{243} present contributes a completely negligible amount to the observed fission was demonstrated by measuring an americium sample containing very nearly the same amount of Am^{242} and more than ten times as much Am^{243}. The observed fissionability in this sample was accounted for by the Am^{242} and allows a limit of less than 40 barns to be set on the fission cross section of Am^{243}.

The recent observation of the isomeric transition from the 16-hour Am^{242m} to the ground state[6] makes it seem likely that the Am^{242} observed in these samples came mainly through the formation of Am^{242m} and its subsequent decay to the ground state. Taking the branching of 20 percent given by O'Kelley *et al.*[6] and a cross section of ~300 barns[7] for the formation of Am^{242m}, the apparent cross section for the formation of Am^{242} in long irradiations (i.e., ≫16 hours) is about 60 barns, in fair agreement with that calculated from the isotopic abundances.

Some old measurements from this laboratory on the fissionability of Am^{242m} should be reinterpreted in the light of the isomeric transition to the highly fissionable Am^{242}. In this old work it was found that the fissionability of a sample of Am^{241} containing 50 parts per million of Am^{242m} (the amount of Am^{242m} was determined by counting the Cm^{242} which grew in and has been corrected for 60 percent beta-decay branching)[6] decayed with a 16-hour half-life to the extent of 2.1 percent. Using these data and taking the fission cross section of Am^{241} as 3.0 barns, the fission cross section of Am^{242} as 6000 barns, and the branching decay of Am^{242m} by isomeric transition as 20 percent, one obtains a fission cross section for Am^{242m} of about 2000 barns for thermal column neutrons. Again this value is subject to large errors.

We would like to express our appreciation to W. H. Zinn for the use of facilities at the Argonne National Laboratory for making the fission measurements. We also wish to thank Professor Glenn T. Seaborg for his continued interest and advice.

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Light Emission from Silicon Carbide

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THE following observations, made some years ago, seem worth recording in view of the recent paper by Lehovec, Accardo, and Jamgochian.[1]

Various crystals found on silicon carbide "pig" having two roughly parallel plane faces were arranged with a "point" contact on one of the faces and another contact elsewhere on the lump of pig to which the crystal was attached (a large area contact to the crystal itself would presumably have served equally well for the latter). The region of the point contact was viewed through the opposite face, and it was seen that the primary source of light is a very small bright region at the contact, of a color like that of the crystal viewed by transmitted light. If one looks through the face of the crystal to which the point contact is made, however, as indicated in Fig. 1 of reference 1, this primary source of light is always eclipsed by the contact wire itself, and a much less intense light from a much larger volume is seen. This appears to be merely scattered and internally reflected light from the now invisible primary source, and its characteristics are modified by both scattering and absorption.

To make observations of spectral distribution which can be interpreted with any certainty, it seems very desirable to look at the contact region through a different face from that to which contact is made, and to make independent measurements of absorption characteristics between these faces, remembering that some crystals vary considerably from one region to another.

Because of the high refractive index of silicon carbide, the contact must lie almost on a normal to the viewing face, otherwise it cannot be seen directly; also the crystal, if deeply colored, must be very thin. Satisfactory crystals are not common, and it may be preferable to obtain specimens by grinding and polishing.

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The Production of Halogen Negative Ions at the Surface of a Thoriated Tungsten Filament*

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BY directing molecular beams of cesium halides at a hot thoriated W wire we have been able to obtain large percentage yields, as shown in Table I, in the production of some of the halogen negative ions. The percentage yield is defined as the ratio of halogen negative ion current from the activated wire to the cesium positive ion current from the deactivated wire. If the dissociation of the molecule into atoms is complete on the surface, then the Cs ion current is equal to more than 99 percent of the incident, neutral beam current.

Because of the relatively high pressure, of the order of 10^{-6} mm Hg, in the apparatus, electron emission and negative ion yield decreased from maximum values obtained immediately after activation of the wire to stable values which remained constant for long periods of time. Although the cesium positive ion current densities at the hot wire were large, around 5×10^{-6} amp/cm², there was no indication that either electron emission or negative ion yield was affected by prolonged "irradiation" by the beam.

At an early stage in the work negative ions from the activated wire were analyzed with a mass spectrometer and found to be halogen ions. No trace of molecular ions was discovered. For the yield measurements presented here a special electrode arrangement was constructed such that with appropriate potentials all charged particles of one sign leaving the wire could be directed through a system of slits into a collecting cup connected to a galvanometer. The fringing field of a strong permanent magnet located outside the apparatus was used to keep electrons from striking the collector. However, the residual electron current was large enough to prevent measurements of ion yields less than 1 percent.

For wire temperatures in the range from 1200°K to 1500°K no substantial change in negative ion yield was observed. Below 1200°K the ion current dropped sharply to zero. Above 1500°K residual electron currents were too large to permit measurements.

We feel that the negative ions are produced by the process of surface ionization rather than by electron capture in the region outside the hot wire because, (1) the negative ion yield was nearly independent of electron emission from the activated wire, and

TABLE I. Halogen negative ion yields.

Beam material	Maximum yield: percent	Stable yield: percent
CsI	4	2
CsBr	20	11
CsCl	60	30
CsF	<1	—